Copyright

Toshiba T2150CD Series Portable Personal Computer User's Manual

First edition January 1995

Disclaimer

This manual has been validated and reviewed for accuracy. The instructions and descriptions it contains are accurate for the Toshiba T2150CD Series Portable Personal Computers at the time of this manual's production. However, succeeding computers and manuals are subject to change without notice. Toshiba assumes no liability for damages incurred directly or indirectly from errors, omissions or discrepancies between the computer and the manual.

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386MAX is a trademark of Qualitas, Inc.

Sound Blaster and Pro are trademarks of Creative Technology Ltd.

FCC Notice

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable

protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, it may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- ❑ Reorient the receiving antenna.

- ❑ Increase the separation between the equipment and receiver.

- ❑ Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

- ❑ Consult the dealer or an experienced radio/TV technician for help.

WARNING

> *This equipment has been certified to comply with the limits for a class B digital device, pursuant to Subpart B of Part 15 FCC rules. Only peripherals certified to comply with the class B limits may be attached to this computer. Operation with non-certified peripherals or peripherals not operated by Toshiba is likely to result in interference to radio and TV reception. Shielded cables must be used between the external devices and the computer's or port replicator's serial port, external monitor port, PS/2 keyboard port, PS/2 mouse port, parallel port and the microphone jack. Shielded cable with core must be used between the external devices and the computer's or port replicator's external diskette drive port. Changes or modifications made to this equipment, not expressly approved by Toshiba or parties authorized by Toshiba could void the user's authority to operate the equipment.*

Industry Canada requirement

This Class B digital apparatus meets all requirements of the Canadian Interference Causing Equipment Regulation.

Cet appareil numérique de la classe B respecte toutes les exigences du Règiement sur le matériel brouilleur du Canada.

Toshiba CD-ROM drive XM-1102B**
Safety Instruction

**means any letters or numbers

CAUTION

> *The CD-ROM drive employs a laser system. To ensure proper use of this product, please read this instruction manual carefully and retain for future reference. Should the unit ever require maintenance, contact an authorized service location see Service procedure.*

CAUTION

> *Use of controls, adjustments or the performance of procedures other than those specified may result in hazardous radiation exposure.*

CAUTION

> *To prevent direct exposure to laser beam, do not try to open the enclosure.*
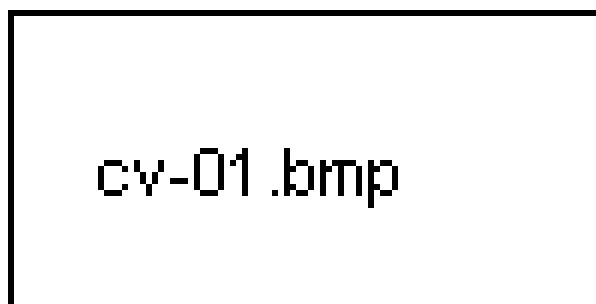
cv-01.bmp

Figure 1 Location of the Required Label

> *CLASS 1 LASER PRODUCT LASERSCHUTZKLASSE 1 PRODUKT TO EN60825*

CAUTION

This appliance contains a laser system and is classified as a "CLASS 1 LASER PRODUCT." To use this model properly, read the instruction manual carefully and keep this manual for your future reference. In case of any trouble with this model, please contact your nearest "AUTHORIZED service station." To prevent direct exposure to the laser beam, do not try to open the enclosure.

VORSCHT

Dieses Gerät enthält ein Laser-System und ist als "LASER PRODUKT DER KLASSE 1" klassifiziert. Für den richtigen Gebrauch dieses Modells die Bedienungsanleitung sorgfältig durchlesen und als Referenz aufbewahren. Falls Probleme mit diesem Modell auftreten, die nächste "autorisierte Services-Vertretung"benachrichtigen. Um einen direkten Kontakt mit dem Laserstrahl zu vermeiden, sollte das Gehäuse nicht geöffnet werden.

CLASS 1 LASER PRODUCT LASERSCHUTZKLASSE 1 PRODUKT TO EN60825

ADVARSEL

Denne mærking er anbragt udvendigt på apparatet og indikerer, at apparatet arbejder med laserstråler af klasse 1, hviket betyder, at der anvendes laserstrlier af svageste klasse, og at man ikke på apparatets yderside kan bilve udsat for utilladellg kraftig stråling.

APPARATET BOR KUN ÅBNES AF FAGFOLK MED SÆRLIGT KENDSKAB TIL APPARATER MED LASERSTRÅLER!

ADVERSAL USYNLIG LASERSTRÅLING VED ÅBNING, NÅR SIKKERHEDSAF-BRYDER ER UDE AF FUNKTION. UNDGÅ UDSÆTTELSE FOR STRÅLING

Indvendigt i apparatet er anbragt den her gengivne advarselsmækning, som advarer imod at foretage sådanne indgreb i apparatet, at man kan komme til at udsætte sig for laserstråling.

Toshiba service procedure

Should this product require maintenance, contact the following Toshiba service station.

TOSHIBA AMERICA INFORMATION SYSTEMS, INC.
DISK PRODUCTS DIVISION
9740 IRVINE BOULEVARD
IRVINE, CA. 92718
TEL: 714-583-3000

TOSHIBA EUROPA (I.E.) G.m.b.H.
DISK PRODUCTS DIVISION
Hammfelddamm 8,
D-41460 Neuss, F.R. Germany
TEL: (02131) 158-0/370
FAX: (02131) 158-390

Preface

Congratulations on your purchase of the Toshiba T2150CD series computer. This powerful, light-weight notebook computer provides excellent expansion capability, including multimedia devices, and it is designed to provide years of reliable, high-performance computing.

This manual tells how to set up and begin using your T2150CD series computer. It also provides detailed information on configuring your computer, basic operations and care, using optional devices and troubleshooting.

If you are a new user of computers or if you're new to Microsoft® Windows™ or portable computing, first read over the *Introduction* and *The Grand Tour* chapters to familiarize yourself with the T2150CD series computer's features, components and accessory devices. Then read *Getting Started* for step-by-step instructions on setting up and getting started on your computer and backing up your preinstalled software.

If you are an experienced computer user, please continue reading the preface to learn how this manual is organized, then become acquainted with this manual by browsing through its pages. Be sure to look over the *Special features* section of the *Introduction*, to learn about features that are uncommon or unique to the T2150CD series computers and carefully read *Setup and Password Security*. Also read *Getting Started* for procedures on backing up your preinstalled software.

Manual Contents

This manual is composed of 13 chapters, four appendixes, and a glossary.

Chapter 1, *Introduction*, is an overview of the T2150CD series computer's features, capabilities, and options.

Chapter 2, *The Grand Tour*, identifies the components of the computer and briefly explains how they function.

Chapter 3, *Getting Started*, provides a quick overview of how to begin operating your computer.

Chapter 4, *Operating Basics*, includes tips on designing your work area, basic operations and how to care for your computer.

Chapter 5, *Disks and Disk Drives,* explains the computer's disk storage devices and how to use them.

Chapter 6, *The Keyboard*, describes the function of each of the keys on the keyboard and how to use the keypad overlay.

Chapter 7, *Power and Power-Up Modes,* gives details on the computer's power resources and battery save modes.

Chapter 8, *Display Panel*, introduces the T2150CD series computer's high resolution display panel and explains how to use its functions.

Chapter 9, *Memory*, describes how to customize the configuration of the computer's memory resources.

Chapter 10, *Toshiba Utilities and Drivers*, describes how to set up special utilities for your T2150CD series computer.

Chapter 11, *Setup and Password Security*, explains how to configure the computer using the TSETUP program in MS-DOS or MaxTime in Windows. It also tells how to set a password.

Chapter 12, *Optional Devices*, describes the optional hardware available.

Chapter 13, *Troubleshooting*, provides helpful information on how to perform some diagnostic tests, and suggests courses of action if the computer doesn't seem to be working properly.

The Appendixes provide technical information about your computer.

The Glossary defines general computer terminology and includes a list of acronyms used in the text.

Conventions

This manual uses the following formats to describe, identify, and highlight terms and operating procedures.

Abbreviations

On first appearance, and whenever necessary for clarity, abbreviations are enclosed in parentheses following their definition. For example: Read Only Memory (ROM). Acronyms are also defined in the Glossary.

Icons

Icons identify ports, dials, and other parts of your computer. The indicator panel also uses icons to identify the components it is providing information on.

Keys

The keyboard keys are used in the text to describe many T2150CD series computer operations. A distinctive typeface identifies the key top symbols as they appear on the keyboard. For example, **Enter** identifies the Enter key.

Key Operation

Some operations require you to simultaneously use two or more keys. We identify such operations by the key top symbols separated by a plus sign (**+**). For example, **Ctrl + C** means you must hold down **Ctrl** and at the same time press **C**. If three keys are used, hold down the first two and at the same time press the third.

DISKCOPY A: B: Text you are to type in is represented in the typeface you see to the left.

Display

`C:>`   Text generated by the computer that appears on its display screen is presented in the type face you see to the left.

Messages

Messages are used in this manual to bring important information to your attention. Each type of message is identified as shown below.

CAUTION

> *Pay attention! A caution informs you that improper use of equipment or failure to follow instructions may cause data loss or damage your equipment.*

NOTE

> *Please read. A note is a hint or advice that helps you make best use of your equipment.*

Chapter 1
Introduction

This chapter provides an equipment checklist and it identifies the T2150CD series computer's features, options and accessories.

CAUTION

Some of the features described in this manual may not function properly if an operating system other than preinstalled Toshiba MS-DOS is used on the computer.

Equipment Checklist

Carefully unpack your computer. Save the box and packing materials for future use. Check to make sure you have all the following items:

- ☐ T2150CD Series Portable Personal Computer
- ☐ External 3 1/2" diskette drive and cable
- ☐ Five spare AccuPoint (pointing device) caps: one green, two blue, two gray
- ☐ AC power cord
- ☐ Key cap stickers (Ctrl, Alt, CapsLock)
- ☐ The following software that is preinstalled on your hard disk:
  - *Toshiba MS-DOS 6.22*
  - *Microsoft Windows™ for Workgroups 3.11*
  - *Companion Utility*
  - *Windows Utility*
  - *Mouseware for AccuPoint driver*
  - *Display drivers for Windows*
  - *Card Manager*
  - *CD-ROM driver*
  - *Audio Applications*
  - *Hypertext on-line help*
- ☐ Your computer's documentation:
  - *T2150CD Series Portable Personal Computer User's Manual*
  - *Microsoft Windows for Workgroups 3.11 & MS-DOS 6.22 User's Guide*
  - *Card Manager User's Guide*

- *Audio Applications User's Guide*

- *International Limited Warranty (ILW) Instruction*

(This instruction is included only with computers sold in ILW supported areas.)

If any of the items are missing or damaged, contact your dealer immediately.

CAUTION

> *The first thing you should do with your computer is make backup diskettes of the MS-DOS and Microsoft Windows for Workgroups files and other software preinstalled on your hard disk. It is important that you make backup diskettes before you begin loading application software. Should any preinstalled files be damaged, you will need to restore them from backup diskettes. Refer to Chapter 3, Getting Started, for procedures on making backup diskettes for files installed on your hard disk.*

The T2150CD series computer uses Toshiba's advanced Large Scale Integration (LSI), Complementary Metal-Oxide Semiconductor (CMOS) technology extensively to provide compact size, minimum weight, low power usage, and high reliability. This computer incorporates the following features and benefits:

Microprocessor	T2150CD series computers are equipped with an SL Enhanced Intel DX4™ microprocessor, which operates at 75 megahertz and incorporates a math co-processor and a 16KB cache memory. The effective processing speed can be changed by the TSETUP or MaxTime program.
Memory	The T2150CDT comes with 8 Megabytes (MB) of Random Access Memory (RAM), expandable to 32MB. And the T2150CDS comes with 4MB of RAM expandable to 28 MB.
	This RAM includes 640KB of conventional memory and 7360KB or 3264KB of extended memory, which can be used as expanded memory compatible with the Lotus-Intel-Microsoft Expanded Memory Specification (LIM-EMS).
Battery pack	The computer is powered by one rechargeable battery pack.
Backup batteries	The computer has two internal batteries: One backs up the computer's special memory features

and the other backs up the internal Real Time Clock (RTC) and calendar.

Keyboard

An easy-to-use 82-key (United States) or 84-key keyboard (Europe) provides a numeric keypad overlay for fast numeric data entry or for cursor and page control. The computer's keyboard supports software that uses a 101- or 102-key enhanced keyboard.

AC power

Simply plug one end of the supplied AC power cord into the computer and the other end into a power outlet supplying voltage between 115 and 240 volts.

Hard disk drive

The T2150CD series computer has a 520 million byte (500MB), integrated, 2 1/2" hard disk drive for nonvolatile storage of data and software.

CD ROM Drive

A full-size, double-speed internal CD ROM drive lets you run 12 cm (4.72") or 8 cm (3.15") compact disks.

This drive supports the following formats:

- Audio CD
- Photo CD
- ISO 9660

3 1/2" external diskette drive

An external 3 1/2" diskette drive accommodates both 1.44MB double-sided, high-density, double-track (2HD) and 720KB double-sided, double-density, double-track (2DD) disks.

Display screen

The displays of T2150CD series computers support high-resolution video graphics. And, they are composed of up to 640 horizontal and 480 vertical pixels (dots), which render 25 lines of standard text 80 characters wide. The screens can be set at a wide range of viewing for maximum comfort and readability.

T2150CDS has a 10.4" full-color, advanced Supertwist Nematic (STN) LCD panel.

T2150CDT has a 10.4" full-color, Thin-Film Transistor (TFT) LCD panel.

Sound system	A Sound Blaster™Pro™ compatible sound system gives your T2150CD series computer multimedia capability. The sound system is equipped with microphone, headphone and line-in jacks and a volume control knob.
Parallel port	A Centronics-compatible parallel interface port lets you connect a parallel printer or other parallel device. This port supports the Enhanced Capability Port (ECP) standard.
Serial port	A standard, 9-pin, serial port lets you connect such serial devices as a serial printer, a mouse, a bar code reader, or an Optical Character Reader (OCR) wand.
External monitor port	The female, 15-pin, D-shell connector lets you connect an external video display.
PS/2 keyboard port	This port lets you connect a PS/2 keyboard to the computer.
Port replicator port	This port enables connection of an optional port replicator, which provides the ports available on the T2150CD series computer, in addition to a PS/2 mouse, a MIDI/Joystick and audio line-out ports.
PCMCIA card slot	A Personal Computer Memory Card International Association (PCMCIA) slot can accommodate two 5 mm cards (Type II) or one 10.5 mm (Type III) card.
Memory expansion socket	A socket is available for installation of a 4, 8, 16 or 24MB Small Outline SIMM (Single In-line Memory Module).
Microphone/ speaker	A built-in microphone and speaker let you record sound into your applications and play it back.
AccuPoint	This pointer control stick, located in the center of the keyboard, provides convenient control of the cursor without requiring desk space for a mouse.
Hotkeys	Convenient key combinations let you quickly modify the system configuration directly from the keyboard without running the system configuration program.

Special Features

The following features are either unique to Toshiba computers or are advanced features, which make the T2150CD series computer more convenient to use.

RAMDRIVE	You can use the MS-DOS RAMDRIVE.SYS driver to allocate part of the computer's memory to a virtual disk called a RAMDRIVE. This lets you use part of the memory as if it were another disk drive. A RAMDRIVE provides faster access speed, but it is volatile, which means any data it contains is lost when you turn off or reset your computer.
AutoResume	If you have to interrupt your work, you can turn off the power without exiting from your software. When you turn on the power again, you can continue working right where you left off.
Pop-up window	This window lets you monitor the battery power level, battery save mode and power up mode (boot or AutoResume). You can also set the battery save mode and the power up mode.
TSETUP	An easy-to-use menu lets you customize the configuration of your T2150CD series computer according to the way you work with your computer and the peripherals you use.
MaxTime	This Windows program lets you set the battery save levels for individual components without leaving Windows to use the TSETUP program.
Fn-esse	This Windows program lets you define your own "shortcut" keys to quickly launch applications and speed your work in Windows.
Display automatic power off	This feature automatically cuts off power to the internal display when there is no keyboard input for a time specified in the TSETUP program or in MaxTime. Power is restored when any key is pressed.
HDD automatic power off	This feature automatically cuts off power to the hard disk drive when it is not accessed for a time specified in the TSETUP program or in MaxTime. Power is restored when the hard disk is accessed.

System automatic power off	This feature automatically turns off power to the system when a period of time specified in the TSETUP program has elapsed. The feature works only in Resume mode.
Advanced power manager	The T2150CD series computer's CPU automatically goes into a halt state when it is not used for a specific time period. This function saves battery power.
Keypad overlay	Light gray keys with white lettering make up the keypad overlay, which lets you use the keyboard for ten-key operations or cursor control.
Intelligent power supply	A microprocessor in the computer's intelligent power supply detects the battery's charge and calculates the remaining battery capacity, which is displayed in the Pop-up Window and MaxTime. It also protects electronic components from abnormal conditions, such as voltage overload from an AC power source.
Battery save mode	This feature lets you save battery power. You can set this mode by using the TSETUP program, MaxTime or hotkey.
Power on password	Your password increases data security by preventing others from accessing your computer when the power is off.
Instant password	A hotkey function blanks the screen and disables keyboard use (except for password entry), preventing access to the computer until the password is entered.
Panel power on/off	This feature turns power to the computer off when the display panel is closed and turns it back on when the panel is opened. This convenient feature can be enabled through the TSETUP program or MaxTime.
Low battery automatic suspend	When battery power is exhausted to the point that computer operation cannot be continued, the system automatically enters the resume mode and shuts down. It is effective even when the computer is in boot mode.

Alarm power on	This feature lets you set a time for the computer to turn on automatically, when the computer is in resume mode. The feature is useful for receiving remote communications while you are asleep or away.

Options

You can add a number of options to make your T2150CD series computer even more powerful and convenient to use. The following options are available:

Memory expansion	A 4, 8, 16, 24 MB small outline SIMM can be easily inserted into the computer's memory slot giving the T2150CDS a maximum of 28MB of RAM and the T2150CDT a maximum of 32MB.
Battery pack	An additional battery pack can be purchased from your Toshiba dealer. The battery pack is identical to the one already installed in your computer. Use it as a spare or replacement.
International keyboards	You can use a number of languages on your computer by replacing your keyboard or using keytop replacements.
Keytop sets	You can customize your keyboard for a variety of languages by replacing the keytops.
Port replicator	The port replicator provides the ports available on the T2150CD series computer, in addition to a PS/2 mouse, MIDI/Joystick and audio line-out ports.
Battery charger	The battery charger lets you charge extra batteries outside the computer.
Security lock	A slot is available to attach a security cable to the computer to deter theft.

The Grand Tour

This chapter identifies the various components of your T2150CD series computer. Become familiar with each component before you operate the computer.

Front With Display Closed

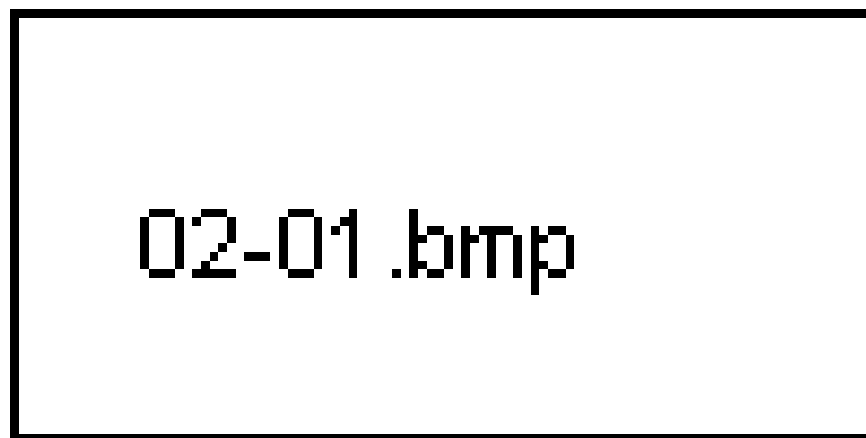Figure 2-1 shows the computer's front with its display panel in the closed position.

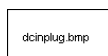*Figure 2-1 Front of T2150CD series computer with display closed*

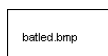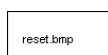|	
Display latch	This latch secures the LCD panel in its closed position.
Palm rest latches	These two latches let you lift up the palm rest when you need to remove or install the battery pack.
AC IN LED	The **AC IN** LED glows green when AC power is supplied. If the internal converter's voltage is abnormal or if the power supply malfunctions, this indicator flashes orange.
Battery LED	The **Battery** LED indicates the condition of the battery's charge: green indicates full charge, orange indicates battery charging and flashing orange indicates a low battery charge. Refer to *Chapter 4, Operating Basics*.
Reset	Press the reset button to reset the computer when it does not respond to keyboard commands. Use a

reset.bmp

does not respond to keyboard commands. Use a narrow object such as the tip of a covered ball-point pen. The system restarts, clearing all data in memory and overriding the AutoResume feature. See Chapter 7, *Power and Power-Up Modes*, for more information on the switch and AutoResume.

CAUTION

Do not use a pencil to push the reset button. Pencil lead can break off inside the computer and damage its circuitry.
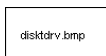
Left Side

Figure 2-2 shows the computer's left side.

02-02.bmp

*Figure 2-2 The left side of the T2150CD series computer*

External 3 1/2" diskette drive port

disktdrv.bmp

This port lets you connect a 3 1/2" diskette drive for transferring data to or from removable diskettes. The **Disk** icon on the indicator panel and diskette drive LED glow green when the drive is in use. To eject a disk from the drive, push the eject button. A flap protects the drive when it's empty. Refer to Chapter 5, *Disks and Disk Drives* .
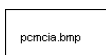
Power

onbutton.bmp

Press the power button to turn the computer's power on and off.

PCMCIA card slot

pcmcia.bmp
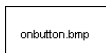
A PCMCIA slot can accommodate two 5 mm PCMCIA cards (Type II) or one 10.5 mm PCMCIA

| | PCMCIA cards (Type II) or one 10.5 mm PCMCIA card (Type III). You can install any industry standard PCMCIA card such as a SCSI adapter, Ethernet adapter or flash memory card. |

Microphone jack

A standard 3.5 mm mini line-in jack enables connection of a monaural microphone or other device for audio input. When you connect an external microphone, the internal microphone is automatically disabled.

Headphone jack
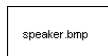
A standard 3.5 mm mini line-in jack enables connection of a stereo headphone (80 ohm minimum) or other device for audio output. When you connect headphones, the internal speaker is automatically disabled.

Line-in jack
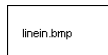
The line-in jack lets you play stereo sound from an external device.

Volume control
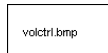
Use this dial to adjust the volume of the system speaker.

Security lock

A security cable attaches to this slot. The optional security cable anchors your computer to a desk or other large object to deter theft.

Right Side

Figure 2-3 shows the computer's right side.
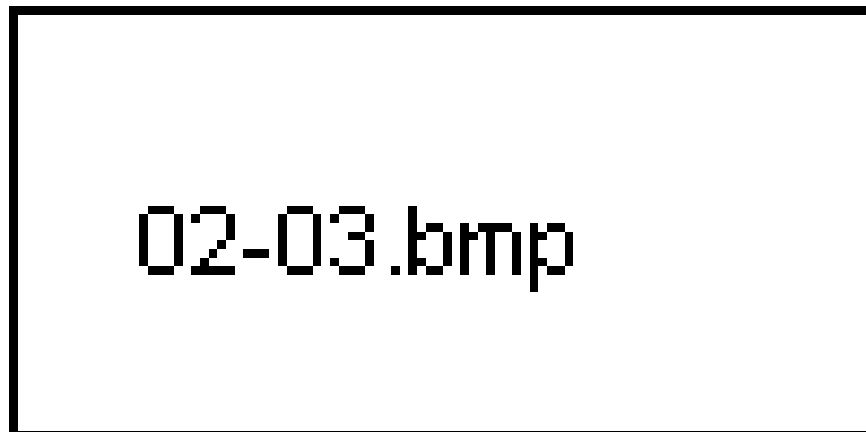
Figure 2-3 The right side of the T2150CD series computer

CD ROM drive   A full-size, double-speed CD ROM drive lets you run 540MB CD ROMs. To open the CD ROM drawer, push the button on the drawer's door. Refer to Chapter 4, *Operating Basics* .

Contrast control   Use this dial to adjust the screen's readability. (Only on the T2150CDS).
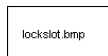
contrast.bmp

Back Side

Figure 2-4 shows the computer's back panel.

02-04.bmp
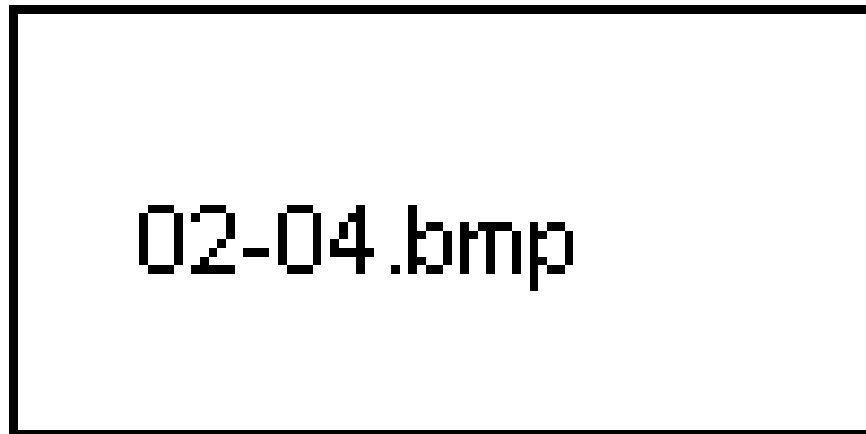
Figure 2-4 The back side of the T2150CD series computer

PS/2 keyboard port   Use this port to connect an external PS/2 compatible keyboard.

pskeyprt.bmp
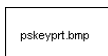
Serial port   Use this 9-pin port to connect external serial devices such as an external modem, a serial mouse or printer.

serial.bmp
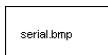
External monitor port   This 15-pin port lets you connect an external video display.

extport.bmp
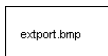
Port Replicator Port   This port enables you to connect an optional port replicator, which provides all the ports available on the

portrep.bmp

portrep.bmp

replicator, which provides all the ports available on the computer as well as PS/2 mouse, audio line-out and joystick ports.

CAUTION

Keep foreign objects out of the port replicator port. A pin or similar object can damage the computer's circuitry.

AC IN

acin.bmp
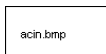
Attach a power cord to the **AC IN** socket and plug the cord into any wall outlet. A built-in converter eliminates the need for an external power adapter.

Parallel port

prntport.bmp
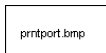
This Centronics-compatible, 25-pin parallel port is used to connect a parallel printer or other parallel device. This port supports the Enhanced Capability Port (ECP) standard.

Underside

Figure 2-5 shows the underside of the computer. Make sure the display is closed before turning over your computer.

02-05.bmp
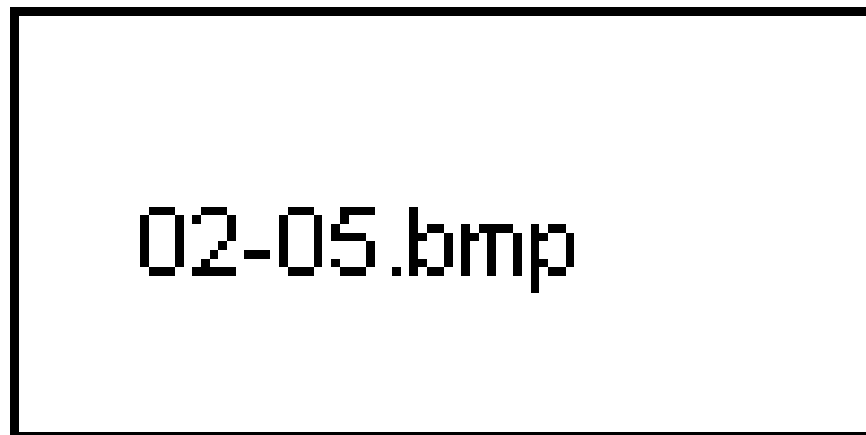
Figure 2-5 The underside of the T2150CD series computer

Port replicator notches Notches are available to secure the port replicator in place.

Expansion memory socket Use this socket to install a Small Outline SIMM (Single In-line Memory Module) to increase your computer's memory by 4, 8, 16 or 24MB. It is protected by a cover. Refer to the *Memory*

Front With Display Open

Figure 2-6 shows the front of the computer with the display open. To open the display, press the display latch and lift the display up. Position the display at a comfortable viewing angle.
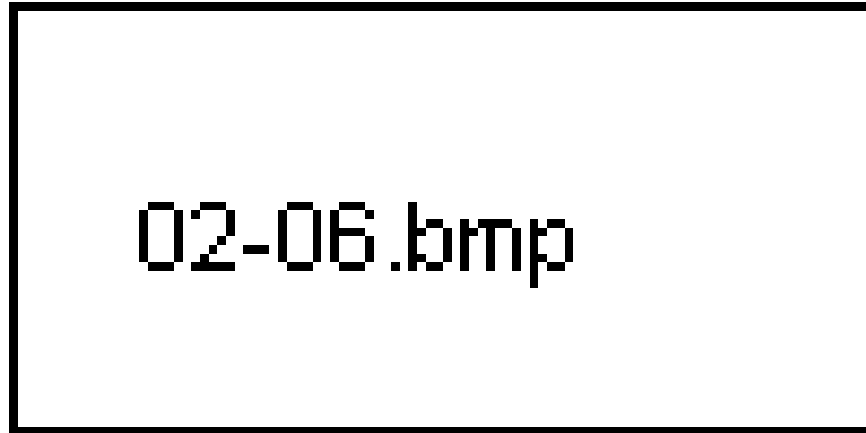
Figure 2-6 The front with the display open

Display screen	The LCD displays high-contrast text and graphics and is compatible with the industry standard Video Graphics Array (VGA). The LCD consists of up to 640 x 480 pixels or dots, forming 80 columns of 25 lines of characters in text mode. The T2150CDS displays full color on an STN screen, and the T2150CDT displays full color on a TFT screen. Refer to Chapter 8, *Display Panel*.
Display hinge	The *display hinge* holds the *display screen* at easy-to-view angles.
Speaker	The speaker transmits audio commands from your software and signals alarms such as low-battery conditions.
Microphone	A built-in microphone lets you record sounds into your applications. See *Using microphone* in Chapter 4, *Operating Basics.*
AccuPoint	A pointer control device located in the center of the keyboard is used to control the on-screen pointer. Refer to the *Using AccuPoint*section in Chapter 4,

AccuPoint control buttons Control buttons below the keyboard let you select menu items or manipulate text and graphics designated by the on-screen pointer.

Indicator panel The indicator panel provides icons for monitoring the status of various computer functions. Details are given in the next section.

Indicator Panel

Figure 2-7 shows the indicator panel lights, which light when various computer operations are in progress.
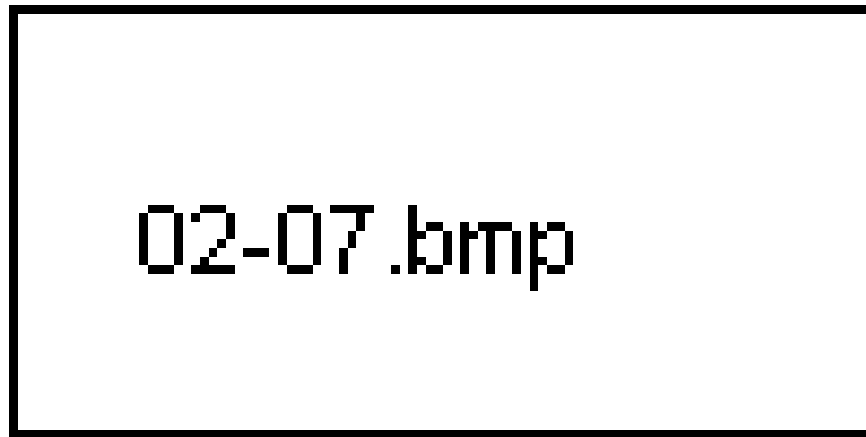
Figure 2-7 The indicator panel
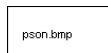
Power/Speed The **Power/Speed** icon shows the processor speed when the computer is on. Green indicates high speed and orange indicates low speed. You can set the processing speed by using the TSETUP program. Refer to the *Processing Speed* section in Chapter 11, *Setup and Password Security*.

Disk This icon glows green when the computer is accessing the internal hard disk, CD-ROM or a diskette. Refer to Chapter 5, *Disks and Disk Drives*.
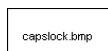
Caps Lock This icon glows green when the alphabet keys are locked in uppercase.

Arrow mode

arrmode.bmp
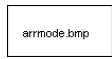
When the **Arrow mode** icon lights green, you can use the keypad overlay (white labeled keys) as cursor keys. Refer to the *Keypad overlay* section in Chapter 6, *The Keyboard*.

Numeric mode

numlock.bmp

You can use the keypad overlay (white labeled keys) for numeric input when the **Numeric mode** icon lights green. Refer to the *Keypad overlay* section in Chapter 6, *The Keyboard*.

Getting Started

This chapter provides basic information to get you started using your T2150CD series computer including the following topics:

- ❑   Setting up your work space — for your health and safety
- ❑   Connecting the AC power cord
- ❑   Using the 3 1/2" external diskette drive
- ❑   Opening the display
- ❑   Turning on the power
- ❑   Inserting and removing diskettes
- ❑   Formatted diskettes
- ❑   Backing up preinstalled software
- ❑   Installing application software
- ❑   Setting up Windows
- ❑   Turning off the power
- ❑   Restarting the computer

If you are a new user, follow the steps in this chapter as you prepare to operate your T2150CD series computer.

If you are an experienced user, read the section on backing up your preinstalled software. Use the backup feature of the Toshiba Companion Utility, not MS-DOS, to make the backup diskettes. Also, glance over the rest of the chapter for any material that might be new to you.

CAUTION

> *Do not fail to make backup diskettes of the preinstalled software before you begin installing applications or working with your computer. If a file should become damaged, you will need the backup diskettes to restore the software.*

Setting Up

Establishing a comfortable work site is important for you and your computer. A poor work environment or stressful work habits can result in discomfort or serious injury from repetitive

strain to your hands, wrists or other joints. Proper ambient conditions should also be maintained for the computer's operation. This section discusses the following topics:

- General conditions
- Placement of the computer and peripheral devices
- Seating and posture
- Lighting
- Work habits

General Conditions

In general, if you are comfortable, so is your computer, but read the following to make sure your work site provides a proper environment.

- Make sure there is adequate space around the computer for proper ventilation.
- Make sure the AC power cord connects to an outlet that is close to the computer and easily accessible.
- The temperature should be 5 to 35 degrees Centigrade (41 to 95 degrees Fahrenheit) and the relative humidity should be 20 to 80 percent.
- Avoid areas where rapid or extreme changes in temperature or humidity may occur.
- Keep the computer free of dust, moisture, and exposure to direct sunlight.
- Keep the computer away from heat sources, such as electric heaters.
- Do not use the computer near liquids or corrosive chemicals.
- Do not place the computer near objects that create strong electromagnetic fields (e.g., stereo speakers).
- Keep the palm rest (battery cover) well secured. Exposure of the battery poses fire and other hazards.

Placement of Computer

Position the computer and peripheral devices to provide comfort and safety.

- Set the computer on a flat surface at a comfortable height and distance. The display should be no higher than eye level to avoid eye strain.
- Place the computer so that it is directly in front of you when you work and make sure you have adaquate space to easily operate a peripheral device.
- Allow adequate space behind the computer to let you freely adjust the display. The

display should be angled to reduce glare and maximize visibility.

☐ If you use a paper holder, set it at about the same height and distance as the computer.

Seating and Posture

The height of your chair in relation to the computer and keyboard as well as the support it gives your body are primary factors in reducing work strain. Refer to the following tips and to Figure 3-1.
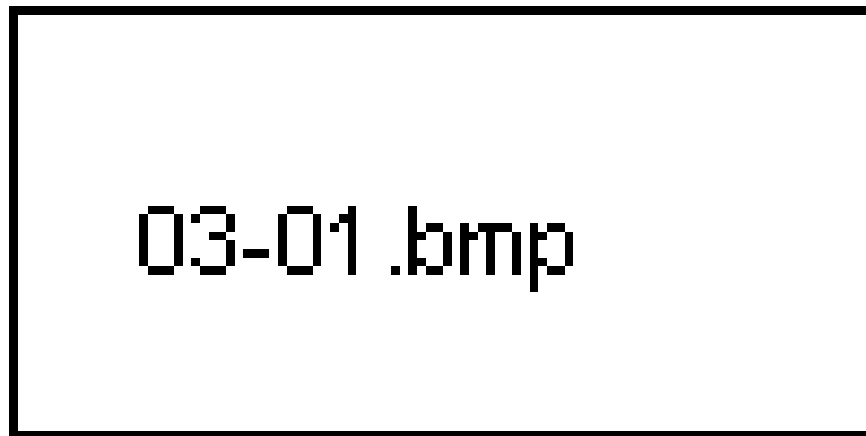
Figure 3-1 Posture and positioning of the computer

☐ Position your chair so that the keyboard is at or slightly below the level of your elbow. You should be able to type comfortably with your shoulders relaxed.

☐ Your knees should be slightly higher than your hips. If necessary, use a foot rest to raise the level of your knees to ease pressure on the back of your thighs.

☐ Adjust the back of your chair so that it supports the lower curve of your spine.

☐ Sit straight so that your knees, hips and elbows form approximately 90 degree angles when you work. Do not slump forward or lean back too far.

Lighting

Proper lighting can improve legibility of the display and reduce eye strain.

☐ Position the computer so that sunlight or bright indoor lighting does not reflect off the screen. Use tinted windows, shades or other screen to eliminate sun glare.

☐ Avoid placing the computer in front of bright light that could shine directly in your eyes.

☐ If possible use soft, indirect lighting in your computer work area. Use a lamp to illuminate your documents or desk, but be sure to position the lamp so that it does not reflect off the display or shine in your eyes.

Work Habits

A key to avoiding discomfort or injury from repetitive strain is to vary your activities. If possible, schedule a variety of tasks into your work day. If you must spend long periods at the computer, finding ways to break up the routine can reduce stress and improve your efficiency.

❑ Sit in a relaxed posture. Good positioning of your chair and equipment as described earlier can reduce tension in your shoulders or neck and ease back strain.

❑ Vary your posture frequently.

❑ Occasionally stand up and stretch or exercise briefly.

❑ Exercise and stretch your wrists and hands a number of times during the day.

❑ Frequently, look away from the computer and focus your eyes on a distant object for several seconds, for example, 30 seconds every 15 minutes.

❑ Take frequent short breaks instead of one or two long breaks, for example, two or three minutes every half hour.

❑ Have your eyes examined regularly and visit a doctor promptly if you suspect you might be suffering from a repetitive strain injury.

A number of books are available on ergonomics and repetitive strain injury or repetitive stress syndrome. For more information on these topics or for pointers on exercises for such stress points as hands and wrists, please check with your library or book vendor.

Connecting Power Cord

T2150CD series computers are equipped with build-in converter circuits that eliminate the need for an external AC adapter. Simply connect the supplied power cord to the computer and a power source supplying 115 to 240 volts, when you need to charge the battery or want to operate from AC power. It is also the fastest way to get started, because the battery pack will need to be charged before you can operate the computer from battery power.

1. Connect the power cord to the **AC IN** socket on the back of the computer.
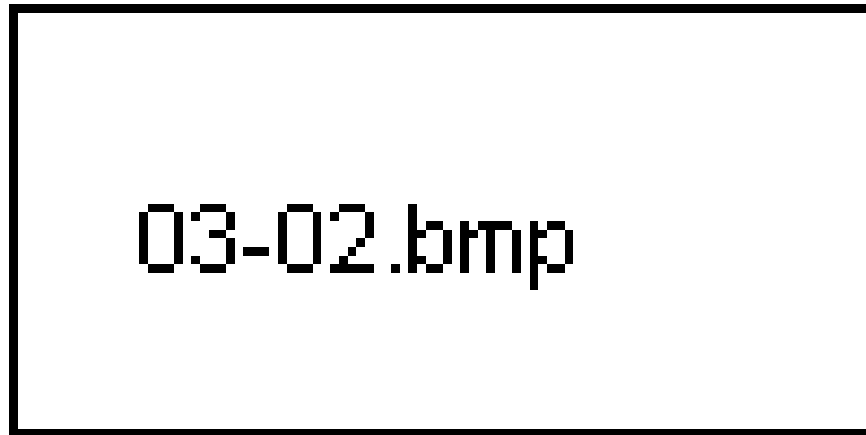
Figure 3-2 Connecting the power cord to the computer

2. Plug the other end of the power cord into a live wall outlet. The **Battery** LED and **AC IN** LED will glow.

When you purchase your T2150CD series computer, the battery is completely discharged. To charge the battery pack so you can operate the computer on battery power, simply leave the AC power cord connected with the computer's power turned off. See the *Main battery* section in Chapter 4, *Operating Basics*, for details.

Using 3 1/2" External Diskette Drive

Use the 3 1/2" external diskette drive to transfer data to and from the computer system and to and from the hard disk.

Connecting 3 1/2" External Diskette Drive

To connect the drive, follow the steps below and refer to Figures 3-3 and 3-4.

1. Plug the connecting cable's larger connector into the 3 1/2" external diskette drive's socket. Press the latches on either side of the connector when you plug in the connector.

NOTE

The connectors are designed so they cannot be misconnected.

Figure 3-3 Connecting the cable to the diskette drive

2. Pull down the cover to the computer's 3 1/2" diskette drive port.

3. Press the latches on either side of the smaller connector and plug it into the diskette drive port.

Figure 3-4 Connecting the cable to the computer

NOTE

When you use the diskette drive, connect the drive before you turn on the computer. If the drive is connected after the computer is turned on, the computer may not recognize the connection. In this case you must restart the computer after the drive is connected.

Disconnecting 3 1/2" External Diskette Drive

When you have finished using the diskette drive, follow the procedures below to disconnect it:

1. Wait for the indicator light to go out to make sure all diskette activity has stopped.

CAUTION

If you disconnect the diskette drive or turn off the power while the computer is accessing the drive you may lose data or damage the diskette or the drive.

2. Press the release latches on either side of the connector attached to the computer and pull out the connector.

3. Close the cover to the diskette drive port.

4. Press the release latches on either side of the connector attached to the diskette drive and pull out the connector.

Opening the Display

The display panel can be rotated in a wide range of viewing angles for optimal viewing.

1. Face the front of the computer and press the display latch.

03-05.bmp
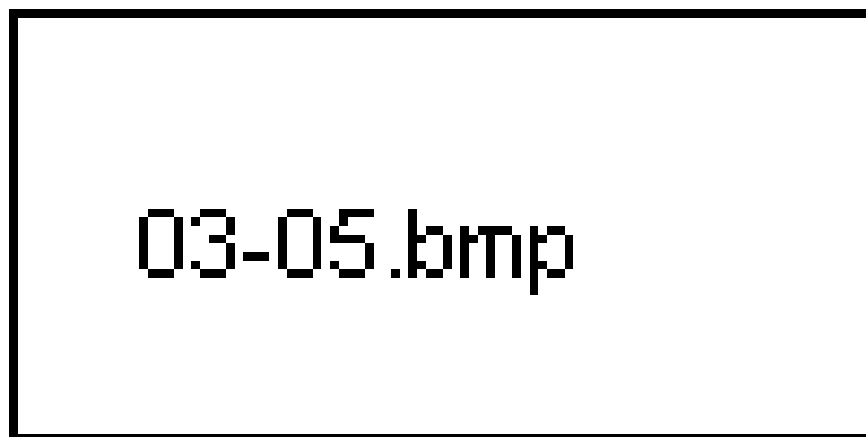
Figure 3-5 Opening the display

2. Lift the panel up and adjust it to the best viewing angle for you.

Turning on the Power

To start your computer, follow the steps below:

1. Make sure the CD ROM drive and external 3 1/2" diskette drive are empty. If a diskette is in the drive, press the eject button and remove the disk.

2. Press and hold the computer's power button for two or three seconds.

Figure 3-6 Turning on the power

3. When you turn on the power for the first time, the following message will be displayed:

```
CAUTION ! !

MS-DOS 6.22 and Microsoft Windows for Workgroups 3.11 are
preinstalled on your hard disk.

The first thing you should do with your computer is make backup
diskettes of the MS-DOS 6.22 and Microsoft Windows for Workgroups
software installed on your hard disk. It is important that you
make backup diskettes before you begin loading application
software. Should any MS-DOS or Microsoft Windows for Workgroups
files be damaged, you will need to restore them from backup
diskettes. For making backup diskettes, you must make Toshiba
Companion Utility diskette. Refer to your documentation for
procedures on making Toshiba Companion Utility diskette and backup
diskettes of files installed on your hard disk.

Do you need to display the above message whenever you boot (Y/N) ?
```

If you prefer to keep this display, press **Y**. If you do not want the message displayed, press **N**.

After you press **Y** or **N**, Windows will run and you will be requested to enter your name, your company's name and product.

Next, you will be requested to select a printer model. Use the arrow keys to move the highlight bar to the model of your printer and press **Enter**.

Finally, you will be requested to select a printer port. After moving the highlight bar to the printer port and pressing **Enter**, Windows installation will be completed. On subsequent start-ups, the computer will initially display the Windows environment.

Inserting and Removing Diskettes

The external 3 1/2" diskette drive provides a convenient means of transferring and storing data. To insert a 3 1/2" diskette into the T2150CD series computer:

1. Hold a diskette with the insertion-arrow side up (hub side down). The metal protective cover should point toward the diskette drive.

2. Put the diskette into the insertion slot. When it is nearly seated, you should feel a slight resistance. Gently push the diskette until it pops into place.
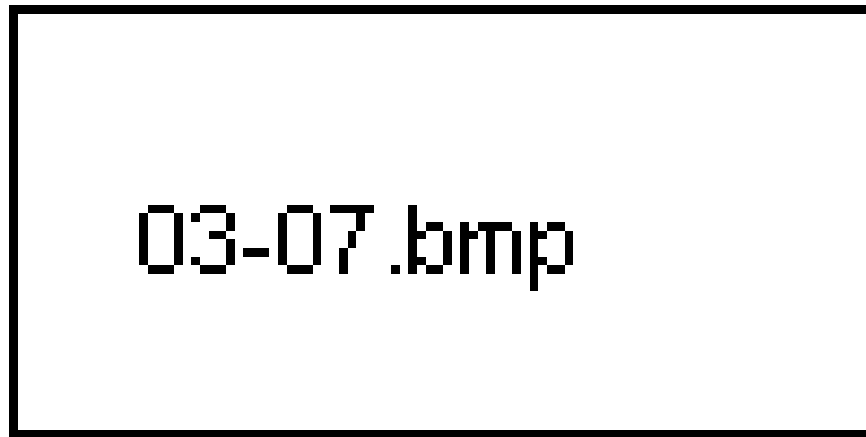
Figure 3-7 Inserting a diskette

3. When the diskette is firmly in place, the diskette eject button pops out. If you insert a diskette upside down or backwards, it will not completely enter the drive or it will keep popping out each time you insert it.

    Never force a diskette in or out of the drive. If it doesn't easily go in, take the diskette out and make sure you are inserting it properly. If the diskette is stuck inside the drive, contact your dealer.

4. Remove a diskette by pressing the diskette eject button. The diskette comes partially out for easy removal. Store the diskette in its storage box.

Formatted Diskettes

Before you can use a diskette, it must be formatted. Some diskettes are sold preformatted. In this case, you only have to insert the diskette into the drive to use it. If your diskettes are not preformatted, refer to the *Formatting disks* section in Chapter 5, *Disks and Disk Drives*. You can also refer to your MS-DOS documentation.

The T2150CD series computers can use either high density 2HD diskettes to store 1.44MB of data or double density 2DD diskettes to store 720KB.

NOTE

> *If you are going to make backup diskettes of your preinstalled software, you can back up files and format your diskettes in one operation as indicated in the next section.*

Backing Up Preinstalled Software

Use BACKUP and RESTORE commands in the Toshiba Companion Utility diskette to back up preinstalled software. You will need to create this diskette as explained below. About 27 diskettes (1.44MB, 2HD) are needed to copy all the files preinstalled on your hard disk.

Making Toshiba Companion Utility Diskette

One set of utilities, which includes BACKUP.EXE, RESTORE.EXE, TSETUP.EXE, TDIAGS.EXE and others, has been set up for installation on a separate diskette. Before backing up the files on your hard disk, follow the steps below to make a Toshiba Companion Utilities diskette.

1. Connect the external 3 1/2" diskette drive if it is not connected.

2. Turn on the power.

3. Insert an empty diskette in the diskette drive.

4. Type **MKDISK** to install the utility files to the diskette.

5. When the message `100% completed` is displayed, remove the diskette from the drive.

6.   Lable the diskette "Toshiba Companion Utility" and store it in a safe place.

Using the BACKUP Command

To use the BACKUP command, connect the external diskette drive if it is not already connected and follow the steps below.

1.   Insert the Toshiba Companion Utility diskette into the diskette drive and press **Ctrl + Alt + Del**.

2.   The Toshiba ACCESS Utility appears. Press **Enter**.

3.   Use the cursor key to highlight `Exit to DOS` and press **Enter**.

4.   At the C:\DOS\> prompt type:

    A:BACKUP C:\ A: /S /F

    If the diskettes you will use to back up preinstalled software are already formatted, you do not have to type /F.

5.   Press **Enter** and the following message will be displayed:

```
Insert backup diskette 01 in drive A:
WARNING: Files in the target drive
A:\ root directory will be erased
Press any key to continue . . .
```

6.   Remove the Companion Utility diskette, insert a blank diskette and press any key. The following message will be displayed:

```
*** Backing up files to drive A: ***

Diskette Number: 01
```

Continue following the on-screen prompts until backup is completed.

NOTE

Be sure to label each diskette used for backup in order from first to last. You will need to use the diskettes in the correct order if you have to restore the files.

Push up the write protect tab on the back of the diskette, so that you can see through the hole. Make sure it snaps securely into place. Store your backup diskettes in a safe place. For more information on labeling and write protecting your diskettes, see Chapter 5, *Disks and Disk Drives*.

Restoring Backed Up Files

If your preinstalled files should become damaged, use RESTORE to copy backup files to

your hard disk.

To use the RESTORE command, connect the external diskette drive if it is not already connected and follow the steps below.

1. Insert the Toshiba Companion Utility diskette into the diskette drive.

2. At the C:\> prompt type:

    A:RESTORE A: C: /S

3. Press **Enter** and the following message will be displayed:

    `Insert backup diskette 01 in drive A:`

    `Press any key to continue...`

Follow the on-screen prompts until all files have been restored.

Installing Application Software

When you have created backup diskettes of the software preinstalled on your hard disk, you can begin installing your application programs. Your applications may require extended memory, expanded memory or other system resources to run correctly.

Check your software documentation to determine its requirements and refer to Chapter 11, *Setup and Password Security* to make sure the computer is set up to work correctly with your software.

Setting Up Windows

If you change a system setting by choosing the Windows Setup icon in the Main group or running the Windows Setup program from the DOS prompt, you may be requested to insert the Windows diskette containing the required driver into drive A. In this case, do not insert the diskette. Instead, type **C:\WINDOWS\DRIVERS** and press **Enter**.

Turning Off the Power

When you have finished work, follow the steps below to turn off the power to your computer.

1. If you have entered data, save it to the hard disk or to a diskette.

2. Exit the application you are using, if you are in boot mode. If you are in resume mode, it is not necessary to exit the application. Refer to Chapter 7, *Power and Power-Up Modes* for information on setting power-up modes.

3. Make sure all disk activity has stopped, then remove any CD-ROM from the internal drive and any diskette from the external 3 1/2" diskette drive.

4. Press and hold the computer's power button until the Power/Speed icon goes off.

5. Turn off the power to any peripheral devices.

Restarting the Computer

Certain conditions require that you reset the system. For example, if:

☐ You change the contents of your CONFIG.SYS file.

☐ An error occurs and the computer does not respond to your keyboard commands.

There are three ways to reset the computer system:

1. Turn the power off, wait 10 to 15 seconds, then turn the power on again by pressing the power button. (This method works only when the computer is in boot mode.)

2. If the computer is already on, press **Ctrl + Alt + Del**.

3. If you're experiencing a problem with a software application and the computer does not accept keyboard input, press the reset button.

```
WARNING: RESUME FAILURE

PRESS ANY KEY TO CONTINUE.
```

Press any key to restart the system.

In boot mode, each of these methods erases all programs and data in RAM. In resume mode, only the second and third methods clear the contents of RAM.

Operating Basics

This chapter gives details on basic operations including accessing disk drives, charging the batteries, using the keyboard's ten-key pad overlay, adjusting the display, using AccuPoint and tips on caring for your T2150CD series computer.

Identifying Drives

MS-DOS and software programs identify disk drives by the letters A, B, C, D, E and so forth. The computer's external 3 1/2" diskette drive is usually drive A. The internal CD-ROM drive is always drive D and the internal hard disk is always drive C. If you partition your hard disk into more than one logical drive, the first partition will be drive C.

If you are using a RAMDRIVE, MS-DOS assigns it the next available identifier after the identifiers for the hard disk (for example, drive E).

Accessing Drives

When you boot your computer from drive C, the screen displays the Windows environment. To change drives, you can use the Windows File Manager or press **Alt + F4** to go to the system prompt. The MS-DOS prompt indicates the current disk drive. For example:

```
C:\>
```

You are now working in drive C. To access other drives, type the disk drive letter followed by a colon (:). For example:

```
C:\>A:
```

Press **Enter**. MS-DOS logs onto drive A, usually the internal diskette drive, and displays a new prompt. If the drive does not contain a disk, or if some other error occurs, MS-DOS displays an error message.

Using the Drive Identifier

Many MS-DOS command lines include drive identifiers. A drive identifier tells MS-DOS where to find or place a file. For example, if the MS-DOS prompt is:

```
C:\>
```

To run a command located on a diskette in drive A, you would type **A:** followed by the command:

<div align="center">**A:***command*</div>

MS-DOS finds and runs the command if it is in the current directory on the diskette in drive A.

You can use drive identifiers in other ways. For example, to copy a file from drive C to drive A using MS-DOS at the system prompt, type:

<div align="center">**COPY C:***sourcefile* **A:***targetfile*</div>

MS-DOS copies the *sourcefile* (the file you want to copy) from the hard disk to the diskette in drive A and names it *targetfile* (any name you choose to type in). The file on the hard disk does not change. For other operations using the COPY command see the MS-DOS documentation.

If you issue a command without specifying a drive, MS-DOS uses the current drive.

Accessing Executable Files on Disks

Usually executable files, or commands, are located on disks. There are three ways to access an executable file.

1. Switch to the directory containing the file, type the file name and press **Enter**. To switch to a directory, type the disk drive and colon, then **cd**, backslash and the directory's name. For example, to change from A drive to the DOS directory on drive C, type:

    c: and press **Enter**, then

    cd\dos and press **Enter**

    Then type the name of the executable file.

2. The above process can be done in one step by including the full path name to the executable file. For example, type:

    c:\dos\TSETUP and press **Enter.**

3. Include the file's path name in the PATH command you are currently using. Refer to your MS-DOS documentation for information on the PATH command.

Main Battery

The T2150CD series computer provides easy procedures for charging the main battery and monitoring its status.

Charging the Battery

The main battery charges when it is installed in the computer and the AC power cord is

connected to the computer and a power outlet.

With the AC power cord connected as described in Chapter 3, *Getting Started,* and the computer turned off, it takes about 2.5 hours to bring a discharged battery up to full charge.

For details on charging and replacing the main battery, see Chapter 7, *Power and Power-Up Modes*.

Battery LED

Check the **Battery** LED on the indicator panel to determine the status of the main battery. The following lights indicate the battery status:

Flashing orange	The battery charge is low. The AC power cord must be connected to recharge the battery.
Orange	Indicates the AC power cord is connected and the battery is being charged with the power off.
Green	Indicates the AC power cord is connected and the battery is fully charged whether the power is on or off.
No light	Under any other conditions, the LED does not light.

Monitoring Battery Capacity

Battery capacity can be monitored by the Pop-up window when you are working in DOS or by MaxTime when you are in Windows.

Pop-up Window

The Pop-up window contains a bar gauge that shows how much power remains in the main battery. Press **Fn + F2** or **Fn + F3** to display the Pop-up window. The bar, labeled ᴇ (for empty) and ꜰ (for full), is automatically set to full when the battery pack is fully charged. For details see the *Monitoring battery capacity* section in Chapter 7, *Power and Power-Up Modes*.

```
Battery Save Mode        :      Full Power

E                 F

Power-up Mode            :      Resume
```

NOTE

MaxTime

Double click the Toshiba Utilities icon in the Windows Program Manager, then double click the MaxTime icon to display a MaxTime window showing the current battery status. You can also use this window to set battery save options, sound system controls and other system configurations. Refer to the *MaxTime* section in Chapter 11, *Setup and Password Security*.

Using AccuPoint

To use the AccuPoint, simply push it with your finger tip in the direction you want to move the on-screen pointer.

Figure 4-1 AccuPoint and control buttons

Two buttons below the keyboard are used like the buttons on a mouse pointer. Press a button to select a menu item or to manipulate text or graphics designated by the pointer.

Refer to Chapter 10, *Toshiba Utilities and Drivers*, for information on setting up the AccuPoint software.

Hand Position

The AccuPoint and control buttons are designed for comfortable operation with either the right or left hand or with both hands. The illustration below shows one example of hand position for using the AccuPoint with the right hand and operating the control buttons with the left hand.

Figure 4-2 Example of hand position for using the AccuPoint

Replacing AccuPoint Cap

Five spare AccuPoint caps are supplied with the T2150CD series computer. These caps are expendable items that should be changed after prolonged use.

1. To remove the AccuPoint cap, firmly grasp the cap and pull it straight up.

Figure 4-3 Removing the AccuPoint cap

2. Position a new cap on the spindle and press it into place.

Using CD ROM Drive

The full-size, double-speed CD ROM drive provides high-performance execution of CD ROM-based programs. You can run either 12 cm (4.72") or 8 cm (3.15") CDs without an adapter.

To load and remove compact disks, follow the steps below and refer to figures 4-4 to 4-7.

1. Press the button on the drawer to open the drawer slightly.

Figure 4-4 Pressing the CD ROM drawer button

2. Grasp the drawer gently and pull until it is fully opened.

Figure 4-5 Pulling the drawer open

3. Lay the CD, lable side up, in the drawer. Press gently at the center to make sure it is seated securely on the spindle.
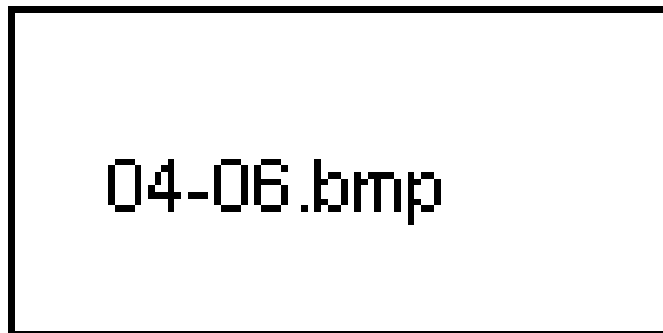
Figure 4-6 Inserting a CD

4. Push the drawer closed. Press gently until it locks into place.

Figure 4-7 Closing the CD ROM drawer

To remove the CD, follow the steps below and refer to figure 4-8.

1. Press the eject button and gently pull the drawer out until it is fully opened.

2. There are indentations on the sides of the drawer to let you grasp the CD. Hold it gently and lift it out.
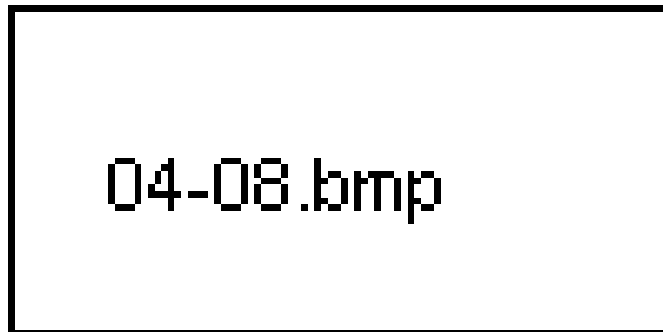
Figure 4-8 Removing a CD

3. Close the drawer. Press gently until it locks into place.

Refer to Chapter 5, *Disks and Disk Drives*, for information on the CD ROM drive and on care and handling of CDs.

Using Microphone

Your computer has a built-in microphone that can be used to record monaural sounds into your applications. It can also be used to issue voice commands to applications that support such functions.

Eliminating Feedback

Since your computer has a built-in microphone and speaker, "feedback" may be heard under certain conditions. Feedback occurs when sound from the speaker is picked up in the microphone and amplified back to the speaker, which amplifies it again to the microphone.

This feedback occurs repeatedly and causes a very loud, high-pitched noise. It is a common phenomenon that occurs in any sound system when the microphone input is output to the speaker (throughput) and the speaker volume is too loud or too close to the microphone.

You can control throughput by adjusting the volume of your speaker or through the Record Monitor or Mute functions.

Record Monitor

This check box feature in the Recording Control Utility controls throughput from the microphone to the speaker during recording. When the sound system software is installed for the first time, this feature's default setting is off (no throughput). Turning it on may cause feedback during recording sessions. If this occurs, either turn down the speaker volume or turn off the Record Monitor option.

Mute

This button under the Mic control in the Mixer Utility controls the throughput from the microphone to the speaker during all functions except recording. When the sound system software is installed for the first time, this feature's default setting is enabled (no throughput). Disabling the Mute feature may cause feedback during normal operation of the computer. If this occurs, either turn down your speaker volume or enable the Mute feature.

Sampling Rate

The option for 44.1 kHz sampling rate in the Extended Recorder Program has been removed due to the large system requirements needed to record at this sampling rate. Recordings made at this sampling rate could be distorted. For distortion free recording please use the 22.05 kHz sampling rate.

Numeric Keypad and Arrow Key Overlay

You can use part of your keyboard as a ten-key keypad in either numeric mode (for numeric data entry) or arrow mode (for cursor and page control). The keypad overlay is indicated by white markings designating numbers and arithmetic functions for numeric entry or arrows and page indicators for cursor and page control.

Figure 4-9 Numeric and arrow overlay

To turn on the numeric mode and press **Fn + F11**, the **Numeric mode** icon lights. Now try numeric data entry.

Arithmetic functions are also available for calculations as indicated by the white marking on the keys.

To turn off the numeric keypad, press **Fn + F11** again. The keyboard returns to normal operation.

Arrow Mode

To turn on the arrow mode and press **Fn + F10**, the **Arrow mode** icon lights. Now try cursor and page control.

To turn off the numeric keypad, press **Fn + F10** again. The keyboard returns to normal operation.

Temporary Access

You can temporarily access and exit either the numeric or cursor overlay without turning it off by pressing the **Fn** key. For more information on using the overlay functions, see .

Adjusting T2150CDS Display

A dial on the right side of the display screen lets you adjust the contrast of the LCD display. This feature is only on the T2150CDS.
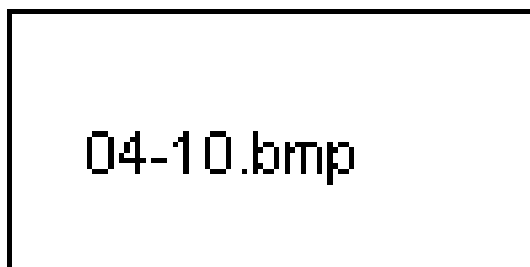
Figure 4-10 The display's contrast dial

Cleaning the Computer

To help assure long, trouble-free operation, keep the computer free of dust and use care with liquids around the computer.

❑ Be careful not to spill liquids into the computer. If the computer does get wet, turn the power off immediately and let the computer dry completely before you turn it on again.

❑ Clean the computer using a slightly damp (with water) cloth. You can use glass cleaner on the display. Spray a small amount of cleaner on a soft, clean cloth and wipe the screen gently with the cloth.

CAUTION

> *Never spray cleaner directly onto the computer or let liquid run into any part of it. Never use harsh or caustic chemical products to clean the computer.*

Moving the Computer

The T2150CD series computer is designed for rugged durability. However, a few simple precautions taken when moving the computer will help assure trouble-free operation.

❑ Make sure all disk activity has ended before moving the computer. Check the **Disk** icon on the computer and the indicators on any external disk drives.

❑ If a CD is in the CD ROM drive, remove it.

❑ Make sure the CD ROM drawer is securely closed.

❑ Disconnect the external 3 1/2" diskette drive and all other peripherals before moving the computer.

❑ Turn off the power to the computer.

❑ Close the display. Do not pick up the computer by its display panel or back (where the interface ports are located).

❑ Disconnect the AC power cord if it is connected.

❑ Use the carrying case when transporting the computer.

Chapter 5

Disks and Disk Drives

Your T2150CD series computer has a number of data storage features. This chapter introduces the computer's data storage devices and describes how to use them.

Types of Disk Drives

The following data storage devices are available:

Hard disk drive	An internal 2 1/2", 520 million byte (500MB) hard disk drive (HDD) provides nonvolatile storage for data and software.
CD-ROM drive	A double-speed internal CD-ROM drive lets you run 12 cm and 8 cm CD-ROMs.
	It supports the following formats:
	• Audio CD
	• Photo CD
	• ISO 9660
3 1/2" external diskette drive	The external 3 1/2" diskette drive stores 1.44MB of data on a diskette. It can also read and write diskettes formatted to store only 720KB.
RAMDRIVE	The T2150CD series computers support RAMDRIVE, a type of RAM Disk. For more information about RAMDRIVE, refer to Chapter 9, *Memory*.

Hard Disk Drive

The internal 2 1/2" hard disk provides high-speed, long-term storage for programs and data. The computer's internal hard disk combines high storage capacity with very rapid access to your data. You cannot write protect the hard disk.

You can allocate separate areas of the HDD to different operating systems. The HDD can support up to four different operating systems.

The area allocated to an operating system is called a partition. Each partition must be set up by the corresponding operating system. MS-DOS uses the FDISK command to create its partition. The MS-DOS documentation explains how to create directories and subdirectories within the partition. Directories and subdirectories help organize your work.

CD ROM Drive

The computer's internal CD ROM drive accommodates either 12 (4.72") cm or 8 cm (3.15") CDs. It provides high-performance double-speed play (reads 300KB per second).

The computer uses an ATAPI interface controller for CD ROM operation.

For directions on loading and unloading CDs, refer to Chapter 4, *Operating Basics*.

CD Care

Handle your diskettes with care. The following simple precautions will increase the lifetime of your diskettes and protect the data you store on them:

1. Store your CDs in the container they came in to protect them and keep them clean.

2. Do not bend the CD or mar its surface.

3. Hold the CD by it outside edge or the edge on the center hole. Fingerprints on the surface may prevent the drive from properly reading data.

4. Do not expose to to direct sunlight, extreme heat or cold. Do not place heavy objects on your CDs.

5. If your CDs become dusty or dirty, wipe them with a clean dry cloth. Wipe from the center out, do not wipe in a circular direction around the CD. If necessary, use a cloth dampened in water or a neutral cleaner. Do not use benzine, thinner or similar cleaner.

3 1/2" External Diskette Drive

The external 3 1/2" diskette drive is useful for installing software on the HDD and exchanging information with other systems. Refer to Chapter 3, *Getting Started*, for information on connecting the 3 1/2" diskette drive.

3 1/2" Diskettes

Two views of a 3 1/2" diskette permanently enclosed in its plastic jacket are shown in figure 5-1. An arrow directing the way to insert the diskette is on one side and a metal hub allowing the diskette drive to spin the diskette is on the other side.

When inserted in a drive, a diskette spins in its jacket and its metal protective covering slides back exposing the diskette's magnetic surface. The diskette drive reads from and writes to a diskette by contacting the diskette's magnetic surface.

A write-protect tab is located at the corner. The section below tells how to write-protect a 3 1/2" diskette.

A space for a press on label is indented on the surface of the protective cover.
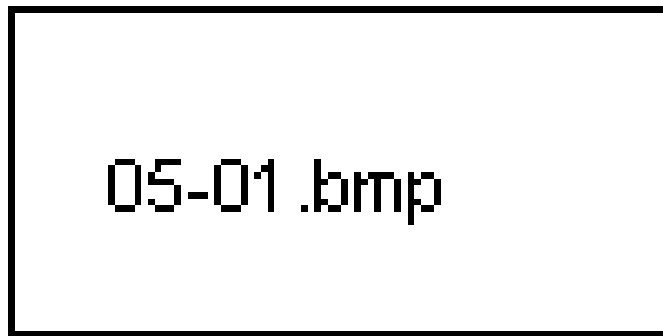
Figure 5-1 A 3 1/2" diskette

Labeling Diskettes

Each diskette usually comes with two press-on labels. It is good practice to label a diskette the first time you use it. Use a felt-tip pen to update the label as you add data to your diskette.

Do not write on the diskette with a hard object such as a ball-point pen or pencil. Also, do not use an eraser on the label. If you use the diskette for something new, just peel off the label and replace it with the extra one.

For more information on treatment of diskettes, refer to the *Diskette care* section in this chapter.

CAUTION

> *Use only press-on labels designed for your diskettes. Other labels may cause a diskette to jam in your diskette drive. Labels with curled edges can also cause the diskette to jam in the drive.*

Write-protecting 3 1/2" Diskettes

Any diskette that contains data you can't afford to lose should be protected from accidental erasure. Sliding the diskette's write-protect tab to its outermost position, as in figure 5-2, write-protects the diskette. Data on a write-protected diskette cannot be erased or altered by a diskette drive.

```
05-02.bmp
```

Figure 5-2 The write-protect tab

To *write-protect* a 3 1/2" diskette, slide the write-protect tab to the outermost position. You should be able to see through the write-protect opening.

To *write-enable* a diskette, slide the tab toward the innermost position. The write-protect opening should be covered.

Diskette Care

Handle your diskettes with care. The following simple precautions will increase the lifetime of your diskettes and protect the data you store on them:

```
storedsk.bmp
```
Store your diskettes in the container they came in to protect them and keep them clean. If a diskette is dirty, do not use cleaning fluid. Clean it with a soft damp cloth.
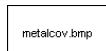
```
metalcov.bmp
```
Do not slide back the diskette's protective metal covering or touch the diskette's magnetic surface. Fingerprints may prevent the diskette drive from reading data from the diskette.

```
tempdisk.bmp
```
Data may be lost if the diskette is twisted; bent; or exposed to direct sunlight, extreme heat or cold.

```
environ.bmp
```
Do not place heavy objects on your diskettes.

```
magnet.bmp
```
Do not eat, smoke, or use erasers near your diskettes. Foreign particles inside the diskette's jacket can damage the magnetic surface.

Magnetic energy can destroy the data on your diskettes. Keep your diskettes away from loud-speakers, radios, television sets and other sources of magnetic fields.

RAMDRIVE

Since a RAMDRIVE, is created in the computer's memory it provides almost instantaneous access to your data. Unlike physical disks, which must be spun like a phonograph record and searched for data, no mechanical process is involved in retrieving data from a RAMDRIVE.

RAMDRIVEs are formatted and used similarly to physical disks.

For information on RAMDRIVE refer to Chapter 9, *Memory* and to your MS-DOS documentation.

Formatting Disks

Diskette Drives and Hard Disk Drives (HDD) function like tape recorders, reading, writing, and erasing magnetically encoded information. Both types of disk drives have read/write heads that are positioned across the disk surface to record and retrieve information.

Formatting enables the read/write heads to locate data by dividing the disk into concentric circles called tracks and further dividing the tracks into sectors. Each item of information on a disk is stored and retrieved according to its unique address identified by the track and sector. Therefore, a disk must be formatted before it can be used.

For information on formatting the hard disk, refer to your MS-DOS documentation.

The following explains how to format 3 1/2" diskettes.

There are two types of 3 1/2" diskettes: 2HD (high density) and 2DD (double density). An inscription on the diskette's cover indicates the kind of diskette. A high density diskette should be formatted to hold 1.44MB of data and a double density diskette should be formatted for 720 MB of data.

NOTE

> *If you format a 2DD diskette to hold 1.44MB or a 2HD diskette to hold 720KB, an error message is displayed.*

Follow these steps to format a diskette from the system prompt:

1. Switch to the directory containing the format command. If you installed MS-DOS in a directory named "DOS," type:

   cd\dos

   and press **Enter.**

2. Depending on the type of diskette you are formatting, type one of the following commands at the system prompt:

format a: formats a 2HD diskette to hold 1.44MB.

format a:/s   formats a 2HD diskette to hold 1.44MB and copies the MS-DOS system files on it.

format a:/f:720   formats a 2DD diskette to hold 720KB.

format a:/f:720/s   formats a 2DD diskette to hold 720KB and copies the MS-DOS system files on it.

3. For either a 2DD or a 2HD diskette, the following message appears:

```
Insert new diskette for drive A:
and press ENTER when ready . . .
```

4. Make sure your diskette is not write protected, then insert it into the diskette drive and press **Enter**. FORMAT displays its progress on your screen.

After formatting is complete, FORMAT lists the actual number of bytes formatted and displays:

```
Format another  (Y/N)?
```

5. Press **Y** if you want to format another diskette or **N** if you're done. Press **Enter**.

CAUTION

Formatting destroys all data on your disk. Be careful when using the MS-DOS FORMAT command.

For more about using the FORMAT command, see your MS-DOS documentation.

System/Non-System Disks

As explained in the previous section, disks can be formatted as either a system or non-system disk. This section describes these disks after they are formatted.

Any diskette can be a system disk, which means you can use it to start up the system on your computer. After you install MS-DOS, create a system disk to use in case your hard disk fails.

Creating a System Disk

To create a system disk:

1. Insert a blank, formatted disk into drive A:

2. Type **sys a:** and press **Enter**.

   MS-DOS copies the system files to the disk.

You can also create a system disk by adding /S to the MS-DOS FORMAT command when you format a disk. To use a system disk, insert it in drive A: and turn on the computer.

You must format a hard disk or a diskette as a system disk in order to automatically start or restart the system from that disk. Hard disks are almost always formatted as system disks. You cannot format a RAMDRIVE as a system disk.

Non-System Disks

Non-system disks do not contain the MS-DOS hidden system files, so you cannot start the computer with them. Store data or make backups of current files using non-system disks.

MS-DOS displays the following message if you try to start the system with a non-system disk:

```
Non-system disk or disk error
Replace and press any key
```

To recover from this error message, you can start the computer from the hard disk simply by removing the diskette and pressing any key. If you need to start from the diskette drive, remove the non-system disk, insert a system disk and press any key.

Protecting Your Data on Diskette

Some diskettes such as those that contain your application programs and operating system should be kept in a safe place and not used on a regular basis.

Program Diskettes

Program diskettes are usually non-system diskettes that contain the files required to run your applications. Diskettes you use to run software should be write-protected to guard against accidental loss of data.

Most software manuals instruct you to copy the program diskettes to other diskettes and store the original program diskettes in a safe place.

If you install your application on diskettes, be aware that some software programs create temporary files on these diskettes. If you run this type of software, do not write protect these diskettes.

Backup Data Diskettes

Use non-system diskettes to back up important personal files and software such as MS-DOS and Windows for Workgroups from your hard disk or diskettes. It's a good idea to write protect backup diskettes and store them in a safe place.

Chapter 6
The Keyboard

All T2150CD series computers' keyboard layouts are compatible with a 101/102-key enhanced keyboard. By pressing some keys in combination, all the 101/102-key keyboard functions can be executed on the computer.

The number of keys on your keyboard depends on which country's keyboard layout your computer is configured with. Keyboards for numerous languages are available. These optional international keyboard layouts are illustrated in Appendix C, *Keyboard Layouts*.

There are five types of keyboard keys: light gray keys, function keys, dark gray keys, soft keys and overlay keys for keypad entry and cursor control.

Light Gray Keys

The light gray keys, like standard typewriter keys, produce the upper- and lower-case letters, numbers, punctuation marks, and special symbols that appear on the screen.

There are some differences, however, between using a typewriter and using a computer keyboard:

❑ Letters and numbers produced in computer text vary in width. Spaces, which are created by a "space character," may also vary depending on line justification and other factors.

❑ The lowercase L (l) and the number (1) are not interchangeable on computers as they are on a typewriter.

❑ The uppercase O (o) and the zero (0) are not interchangeable.

❑ The **Caps Lock** function key locks only the alphabetic characters in uppercase while the shift lock on a typewriter places all keys in the shifted position.

❑ The **Shift** keys, the **Tab** key, and the **BkSp** (backspace) key perform the same function as their typewriter counterparts but also have special computer functions as described in the following sections.

F1...F12 Function Keys

The function keys, not to be confused with **Fn**, are the 12 keys at the top of your keyboard. These keys are dark gray, but function differently from the other dark gray keys.

F1 through **F12** are called function keys because they execute programmed functions when

pressed. Used in combination with the **Fn** key, keys marked with icons execute specific functions on the T2150CD series computer. See the section, *Soft keys: Fn key combinations*, in this chapter. The function executed by individual keys depends on the software you are using. Use the template, above the function keys, to identify the task the function keys perform. Use a soft lead pencil to write on the template. Remove the template to write or erase commands, because pencil lead and eraser dust can damage your T2150CD series computer if it gets inside.

Dark Gray Keys

The dark gray function keys execute special computer functions.

The operating system or software application you are using determines the function of each key. Some software packages alter how some keys work. Refer to your software documentation for more information. Refer to your MS-DOS documentation for a complete description of how each key functions in MS-DOS.

This section describes how the dark gray keys work in MS-DOS, and how some keys may act when you use word processor and spreadsheet software.

tab.bmp

In MS-DOS, the **tab** key moves the cursor eight spaces to the right. Some software packages use **Shift + tab** to move the cursor back to the previous tab position, but this function does not operate in MS-DOS.

backspc.bmp

BkSp moves the cursor one character to the left and deletes the character.

enter.bmp

Enter ends a line or screen input. This key is also referred to as the "return" key.

shift.bmp

Pressing **Shift** on either the left or right side of the keyboard changes the keyboard mode, providing access to upper-case characters, and the symbols above the number keys. Shift functions only as long as you continue to hold it down. If the **Caps Lock** key is on, **Shift** produces lower-case characters.

capslck.bmp
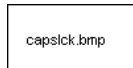
Caps Lock is a toggle key. Pressing **Caps Lock** once produces all upper-case alphabetic characters. Pressing **Caps Lock** again, returns you to normal typing. The **Caps Lock** icon lights when the function is on.

ins.bmp
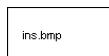
Ins (insert) is used to insert data.

del.bmp
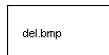
Del (delete) is used to delete data.

ctrlalt.bmp
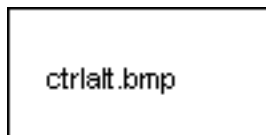
Pressing **Ctrl** or **Alt** with other keys sends special instructions to the computer. Refer to your software documentation for more information on how these keys function with each software application.

psctrls.bmp
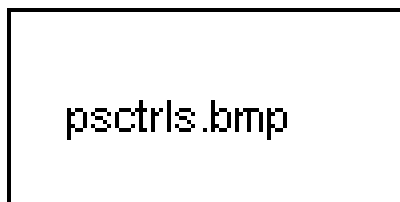
Pause or **Ctrl + S** suspends program execution. Press any key except **Pause** to resume program execution.

ctlpctlc.bmp

Ctrl + Pause (Break) or **Ctrl + C** halts program execution.

NOTE

> *Some application programs use **Ctrl + S** or **Ctrl + C** to execute other functions. Such applications may use other key combinations to suspend or halt program execution.*

prtscr.bmp

Pressing **PrtSc** in MS-DOS and some applications sends the current contents of the display to the printer.

pguppgdn.bmp

PgUp (page up) and **PgDn** (page down) move the screen display one page up or down, respectively. These features work only if your software supports them. **PgUp** and **PgDn** have no effect in MS-DOS.

hoenar.bmp

Home, End, ←, →, ↑, and ↓ move the cursor in the indicated direction based on your software cursor movement conventions.

In MS-DOS, ← and → have the same effect as **BkSp** and **F1**, respectively. Refer to your MS-DOS documentation for more information about how these keys function in MS-DOS.

fn.bmp

Fn (function) is used in combination with other keys to form soft keys. Soft key functions are labeled on the fronts of the keys that activate the functions. Refer to the next section, *Soft keys: Fn key combinations* for more information.

esc.bmp

In MS-DOS you can cancel all the characters typed on a line by pressing **Esc**. A backslash

(\) is displayed and the cursor moves down one line. You can continue typing as if you started a new line. In other applications, **Esc** lets you exit the program you are using or return to the previous screen or function.

Soft Keys: Fn Key Combinations

The **Fn** (function) is unique to Toshiba computers and is used in combination with other keys to form soft keys. Soft keys are key combinations that enable, disable or configure specific features.

Emulating Keys on Enhanced Keyboard
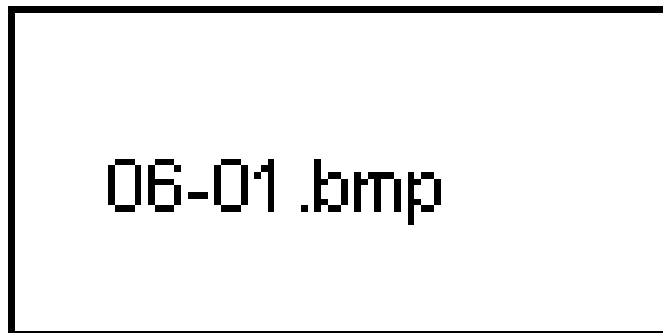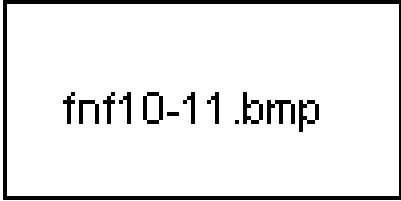
Figure 6-1 A 101-key enhanced keyboard layout
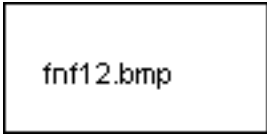
The T2150CDS Series keyboard is designed to provide all the features of a 101-key enhanced keyboard. The 101/102-key enhanced keyboard has a numeric keypad and scroll lock key. It also has additional **Enter**, **Ctrl** and **Alt** keys to the right of the main keyboard. Since the T2150CDS Series keyboard is smaller and has fewer keys, some of the enhanced keyboard functions must be simulated using two keys instead of one on the larger keyboard.

Your software may require you to use keys that the keyboard does not have. Pressing the **Fn** key and one of the following keys simulates the enhanced keyboard's functions.

fnf10-11.bmp

Press **Fn + F10 (arrow mode**) or **Fn + F11 (NumLock**) to access the integrated keypad. When activated, the light gray keys with white numbers can be used for cursor control or numeric data entry. Refer to the *Keypad overlay* section in this chapter for more information on how to operate these keys. The power on default for both settings is off.

fnf12.bmp

Press **Fn + F12** (**ScrLock**) to lock the cursor on a specific line. In MS-DOS, this has no effect. The power on default is off.

fnenter.bmp

Press **Fn + Enter** to simulate **Enter** on the enhanced keyboard's numeric keypad.

fnctrl.bmp

Press **Fn + Ctrl** to simulate the enhanced keyboard's right **Ctrl** key.

fnalt.bmp

Press **Fn + Alt** to simulate the enhanced keyboard's right **Alt** key.

Hotkeys

Hotkeys (**Fn** + a function or cursor key) let you enable or disable certain features of the T2150CD series computers.

```
fnf1.bmp
```

Instant Security

Press **Fn + F1** to lock the keyboard and blank the screen to prevent others from accessing your data. To restore the computer operation, enter the password. See Chapter 11, *Setup and Password Security*.

```
fnf2.bmp
```
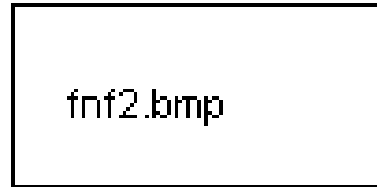
Battery Save Mode

Pressing **Fn + F2** changes the battery save mode. When you press **Fn + F2** in a DOS environment, the Pop-up window below appears at the top left of the display, showing the current battery save mode. Continue holding down **Fn** and press **F2** again to change to one of the three battery save modes: Full power, low power and user setting.

```
Battery Save Mode        :    Full Power

E XXXXXXXXXXXXXXX F

Power-up Mode            :    Resume
```

If you press **Fn + F2** in a Windows environment, an icon panel is displayed. Continue holding down **Fn** and press **F2** again to change the setting. The highlighted icon changes according to the current setting. The mode at power on depends on the TSETUP program setting. See Chapter 11, *Setup and Password Security*.

```
fnf3.bmp
```
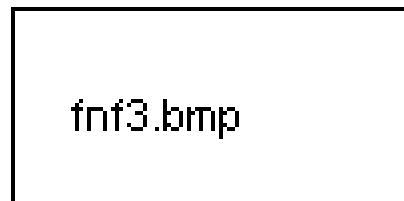
Resume Mode/Boot Mode

Pressing **Fn + F3** toggles between Resume mode and boot mode. When you press **Fn + F3** in a DOS environment, the Pop-up window below appears at the top left of the display, showing the current power up mode. Continue holding down **Fn** and press **F3** again to change the setting.

```
Battery Save Mode        :      Full Power

E XXXXXXXXXXXX F

Power-up Mode            :      Resume
```

If you press **Fn + F3** in a Windows environment, an icon panel is displayed. Continue holding down **Fn** and press **F3** again to change the setting. The highlighted icon changes according to the current setting.See Chapter 11, *Setup and Password Security* for information on changing the setting using the TSETUP program.

```
fnf4.bmp
```
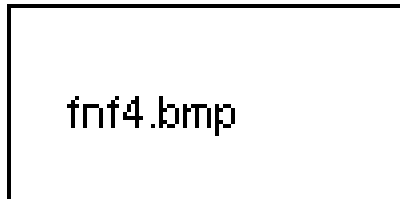
Alarm Volume

Press **Fn + F4** to adjust the alarm volume to low, medium, high or off. When you press **Fn + F4**, a beep sounds to let you know the current alarm volume. Continue holding down **Fn** and press **F4** again to change the setting. The volume at power on depends on the TSETUP program setting. See Chapter 11, *Setup and Password Security*..

```
fnf5.bmp
```

Display Selection

Pressing **Fn + F5** changes the active display device. As indicated in the table below, the changes depend on the computer's display type, TSETUP setting and whether you have an external monitor connected.

TSETUP	Active display	Change order
Internal/External	Internal	Int. -> Sim. -> Ext.
	External	Ext. -> Int. -> Sim.

Accessing the Pop-up Window

fnf2f3.bmp
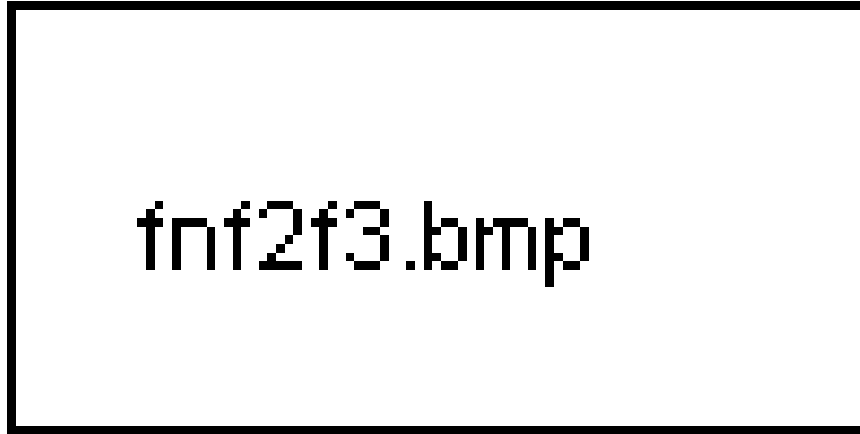
Press **Fn + F2** or **Fn + F3** to open the Pop-up window. While holding the **Fn** key press **F2** again to change the battery save mode, or press **F3** again to toggle between Resume and Boot modes.

NOTE

> *This soft key will not work if you are using a non-MS-DOS operating system or certain application software programs.*

Emulating Fn Key on External Keyboard

The **Fn** key is only on Toshiba keyboards. If you use an external keyboard attached to the computer or to an optional port replicator, you can execute **Fn** key combinations by emulating the **Fn** key. For example, you might hold down left **Shift +** left **Ctrl** then press **F3** to change the power up mode. See Chapter 11, *Setup and Password Security*., for details on setting the **Fn** key equivalent.

Keyboard Layout

The TSETUP program lets you alter the arrangement of the **Caps Lock**, **Ctrl** and **Alt** keys according to the layouts shown below. See Chapter 11, *Setup and Password Security* for details on changing the configuration.

If you choose the alternative layout, cover the **Caps Lock**, **Ctrl** and **Alt** key with the alternative stickers that are provided with the computer.

altesam.bmp

altnorm.bmp

Keypad Overlay

Your computer's keyboard does not have an independent numeric keypad, but its numeric keypad overlay functions like one.

The keys in the center of the keyboard with white letters make up the numeric keypad overlay. The overlay provides the same functions as the numeric keypad on the 101/102-key enhanced keyboard in Figure 6-2.

Turning on the Overlay

The numeric keypad overlay can be used for numeric data input or cursor and page control.

Arrow Mode

To turn on the Arrow mode, press **Fn + F10** (**Arrow Mode** icon lights). Now try cursor and page control using the keys shown in Figure 6-2. Press **Fn + F10** again to turn off the overlay.

Numeric Mode

To turn on the Numeric mode, press **Fn + F11** (**Numeric mode** icon lights). Now try numeric data entry using the keys in Figure 6-2. Press **Fn + F11** again to turn off the overlay.

06-02.bmp

Figure 6-2 The numeric keypad overlay

Temporarily Using the Normal Keyboard (overlay on)

While using the overlay, you can temporarily access the normal keyboard without turning off the overlay:

1. Hold **Fn** and press any other key. All keys will operate as if the overlay were off.

2. Type upper-case characters by holding **Fn + Shift** and pressing a character key.

3. Release **Fn** to continue using the overlay.

Temporarily Using the Overlay (overlay off)

While using the normal keyboard, you can temporarily use the keypad overlay without turning it on:

1. Press and hold down **Fn**.

2. Check the icon panel. Pressing **Fn** turns on the most recently used overlay. If the **Numeric mode** icon lights, you can use the overlay for numeric entry. If the **Arrow mode** icon lights, you can use it for cursor and page control.

3. Release **Fn** to return to normal keyboard operation.

Temporarily Changing Modes

If the computer is in **Numeric mode**, you can switch temporarily to **Arrow mode** by pressing a shift key.

If the computer is in **Arrow mode**, you can switch temporarily to **Numeric mode** by pressing a shift key.

Generating ASCII Characters

Not all ASCII characters can be generated using normal keyboard operation. But, you can generate these characters using their ASCII codes.

With the overlay on:

1. Hold down **Alt**.

2. Using the overlay keys, type the ASCII code.

3. Release **Alt**, and the ASCII character appears on the display screen.

With the overlay off:

1. Hold **Fn + Alt**.

2. Using the overlay keys, type the ASCII code.

3. Release **Fn + Alt**, and the ASCII character appears on the display screen.

A list of ASCII characters with their codes is in *Appendix B*.

Chapter 7
Power

The computer's power resources include the AC power cord and internal batteries. This chapter gives details on making the most effective use of these resources including charging and changing batteries, tips for saving battery power, and power up modes in DOS and Windows.

Power Conditions

The computer's operating capability and battery charge status are affected by the power conditions: whether an AC power cord is connected, whether a battery is installed and what the charge level is for the battery.

Table 7-1 Power conditions

		Power on	Power off (no operation)
AC cord connected	Battery fully charged	{bmcrnbullet.bmp} Operates {bmcrnbullet.bmp} Trickle charge {bmcrnbullet.bmp} LED: Battery green AC IN green	• Trickle charge • LED: Battery green AC IN green
	Battery partially charged or no charge	{bmcrnbullet.bmp} Operates {bmcrnbullet.bmp} Trickle charge {bmcrnbullet.bmp} LED: Battery off AC IN green	• Quick charge • LED: Battery orange AC IN green

	No battery installed	{bmcrnbullet.bmp} Operates
		
		{bmcrnbullet.bmp} No charge
		
		{bmcrnbullet.bmp} LED:
		
		  Battery off
		
		  AC IN green
			• No charge
			
			• LED:
			
			  Battery off
			
			  AC IN green

AC cord not connected	Battery charge is above low battery trigger point	{bmcrnbullet.bmp} Operates
		
		{bmcrnbullet.bmp} LED:
		
		  Battery off
		
		  AC IN off	

	Battery charge is below low battery trigger point	{bmcrnbullet.bmp} Operates
		
		{bmcrnbullet.bmp} Alarm sounds
		
		{bmcrnbullet.bmp} LED:
		
		  Battery flashes orange
		
		  AC IN off	

	Battery charge exhausted	Computer goes into resume mode and shuts down	
	No battery installed	{bmcrnbullet.bmp} No operation {bmcrnbullet.bmp}	

LED:

Battery off

AC IN off

Power LEDs

As shown in the above table, LED indicators on the front of the computer alert you to the computer's operating capability and battery charge status.

Battery LED

Check the **Battery** LED to determine the status of the main battery. The following LED lights indicate the battery status:

Flashing orange	The battery charge is low. The AC power cord must be connected to recharge the battery.
Orange	Indicates the AC power cord is connected and charging the battery with the power off.
Green	Indicates the AC power cord is connected and the battery is fully charged whether the power is on or off.
No light	Under any other conditions, the LED does not light.

AC IN LED

Check the **AC IN** LED to determine the power status with the AC cord connected:

Green	Indicates the AC power cord is connected and supplying proper power to the computer.
Flashing green	Indicates a problem with the power supply. Try plugging the power cord into another AC outlet. If the LED still flashes, there could be a problem with the internal converter. See your dealer.

Battery Types

The computer has three types of batteries:

❑ Main battery pack

❑   Backup battery

❑   Real Time Clock (RTC) battery

Main Battery

The removable main battery pack, also referred to in this manual as the main battery, is the computer's main power source when the AC power cord is not attached.

You can purchase additional battery packs for extended use of the computer away from an AC power source. One battery pack model is interchangeable among T2150CD series computers.

The main battery recharges both the backup and the RTC batteries when the system's power is on.

The backup and main battery maintain the state of the computer when you enable AutoResume.

Backup Battery

The backup battery provides power for the computer's AutoResume feature. It backs up data and programs in memory when the power is off, when the AC power cord is removed and when the main battery pack is fully discharged or removed. If the backup battery is completely discharged, AutoResume does not function and the computer loses all data in memory. The following message appears when you turn on the power:

`WARNING: RESUME FAILURE.`

`PRESS ANY KEY TO CONTINUE.`

Real Time Clock Battery

The Real Time Clock (RTC) battery provides power for the internal real time clock and calendar. It also maintains the system configuration, the TSETUP program's values and the Pop-up window's contents.

If the RTC battery becomes completely discharged, the system loses this data and the real time clock and calendar stop working. The following message appears when you turn on the power:

`*** Error in CMOS. Bad battery ***`

`Check system. Then press [F1] key . . . . . .`

CAUTION

Care and Use of the Battery Pack

The battery pack is a vital component of portable computing. Taking proper care of it will help assure longer operating time on battery power as well as a longer life for your battery pack. Follow the instructions in this section carefully to assure safe operation and maximum performance.

Safety Precautions

1. Never try to disassemble the battery pack.

2. Do not overcharge, short circuit, reverse charge, mutilate or incinerate the battery. Any one of the above actions could result in the release of toxic materials, release of hydrogen and/or oxygen or an increase in the battery's surface temperature.

3. If the battery has leaked or been vented, it should be replaced immediately. Use protective gloves when handling a damaged battery.

4. When it becomes necessary to replace the main battery, it must be replaced only by an identical battery from the same manufacturer. Only one battery can be installed in the T2150CD series at a time; however, if batteries for the computer are connected in series for other use, it is recommended that all batteries be replaced at the same time.

5. Reverse polarity should be avoided with all batteries. The T2150CD series main battery is designed so that it cannot be installed in reverse polarity.

Charging the Batteries

When the power in the battery pack becomes low, the **Battery** LED flashes orange indicating that only a few minutes of battery power remain. If you continue to use the computer while the **Battery** LED flashes, the computer enables resume mode (so you don't lose data) and automatically turns off.

You must recharge a battery pack when it becomes discharged.

NOTE

Once a battery pack is fully charged, it is recommended that you operate the computer only on battery power until the battery pack completely discharges. Doing so extends battery life and helps assure accurate monitoring of battery capacity.

Procedures

To recharge a battery pack while it is installed in the computer, connect the AC power cord to the **AC IN** socket and plug the other end into a working outlet. Turn the computer off.

The **Battery** LED glows orange when the battery is being charged.

CAUTION

> *Use only the T2150CD series computer connected to an AC power source or the optional Toshiba Battery charger to charge the battery pack. Do not attempt to charge the battery pack with any other charger.*

Time

The following table shows the time required to fully charge a discharged battery.

Charging time (hours)

Battery	Power on	Power off
Battery pack	Trickle charge	2.5
Backup battery	20	20
RTC battery	48	doesn't charge

Battery Charging Notice

The battery may not charge right away under the following conditions:

1. The battery is extremely hot or cold. To assure the battery charges to its full capacity, charge the battery at room temperature of 10° to 30°C (50° to 88°F).

2. The battery is nearly completely discharged. Leave the AC power cord connected for a few minutes and the battery should begin charging.

The **Battery** LED may show a rapid decrease in battery operating time when you try to charge a battery under the following conditions:

❑ The battery has not been used for a long time.

❑

❑ The battery completely discharged and left in the computer for a long time.

❑ A cool battery is installed in a warm computer.

In such case, follow the steps below.

1. Fully discharge the battery by leaving it in the computer with the power on until the power automatically shuts off.

2. Plug in the AC power cord.

3. Charge the battery until the **Battery** LED shows green.

Repeat these steps two or three times until the battery charge recovers normal capacity.

Monitoring Battery Capacity

Remaining battery power can be monitored by a Pop-up window or by the MaxTime program, which is available only in Windows. This section explains how to use the Pop-up window. For information on MaxTime, refer to Chapter 11, *Setup and Password Security*.

The Pop-up window contains a bar gauge that shows how much power remains in the main battery.

Press **Fn + F2** or **Fn + F3** to display the Pop-up window. The bar, labeled **E** (for empty) and **F** (for full), is automatically set to full when the battery pack is fully charged.

NOTE

If you open the Pop-up window by pressing **Fn + F2** *and continue holding down* **Fn**, *pressing* **F2** *again changes the battery save mode. In the case of* **F3**, *the Resume/Boot mode changes. See* Chapter 6, The Keyboard.

```
Battery Save Mode        :    Full Power

E XXXX        F

Power-up Mode            :    Resume
```

If the battery pack is completely discharged to the point where the computer automatically shuts down, the graph is set to empty.

The first time you use your computer and when you remove and replace the battery pack, **???** will appear between **E** and **F**.

The Pop-up window values are shown below:

F	Full.
E	Empty.
N/A	The battery is not installed or cannot be accessed by the computer.
???	The remaining charge of the battery pack cannot be determined because the battery pack has been removed or replaced. In this case the TSETUP or MaxTime program, described in Chapter 11, *Setup and Password Securtiy*, can be used to manually set the battery capacity.

Battery capacity can also be monitored using MaxTime, which is explained in Chapter 11, *Setup and Password Security*.

Maximizing Battery Operating Time

A battery's usefulness depends on how long it can provide power on a single charge.

How long the charge lasts in a battery depends on:

❑ How you configure the computer (for example, whether you enable battery-power saving options) The T2150CD series computers provide a battery save mode to conserve battery power. This mode has the following four options:

- CPU sleep mode
- Display auto off
- HDD auto off
- LCD Brightness

See Chapter 11, *Setup and Password Security*.

❑ How often and how long you use the hard disk, CD-ROM and the 3 1/2" external diskette drive.

❑ How much charge the battery contained to begin with.

❑ How you use optional devices, such as the card modem, to which the battery supplies power.

❑ Enabling AutoResume conserves battery power if you are frequently turning the computer off and on.

❑ Where you store your programs and data. (It takes less power to access data in a RAMDRIVE, for example, than on a diskette or the hard disk.)

- ❑ Closing the display when you are not using the keyboard saves power.

- ❑ Operating time decreases at low temperatures.

- ❑ The condition of the battery terminals. Make sure the battery terminals stay clean by wiping them with a clean dry cloth before installing the battery pack.

Retaining Data With Power Off

When you turn off your computer with fully charged batteries, the batteries retain data for the following approximate time periods:

Battery pack	4 days
Back up battery	5 hours
RTC battery	1 month

Extending Battery Life

To maximize the life of your battery pack:

- ❑ Occasionally completely discharge the battery before you recharge it.

- ❑ If you have extra battery packs, rotate their use.

- ❑ If you will not be using the system for an extended period, remove the battery pack.

- ❑ Disconnect the AC power cord when the battery is fully charged. Overcharging makes the battery hot and shortens life.

- ❑ Store spare battery packs in a cool dry place out of direct sunlight.

Replacing the Battery Pack

When the battery pack reaches the end of its operating life you will need to install a new one. The life of the battery pack is generally about 500 recharges. If the **Battery** LED flashes orange shortly after fully recharging the battery, the battery pack needs to be replaced.

You might also replace a discharged battery pack with charged spare when you are operating your computer away from an AC power source. This section explains how to remove and install battery packs.

CAUTION

> *When handling battery packs, be careful not to short circuit their terminals.*

Removing a Battery Pack

To replace a discharged battery pack, follow these steps:

1. Save your work.

2. If you plan to resume working right away, press **Fn + F3** to open the Pop-up window and confirm that Resume mode is enabled (this saves time when you restart the computer).

3. Turn the computer's power off.

4. Remove all cables connected to the computer and open the display panel.

5. Push up on two latches on the front of the palm rest until you feel them click.

6. Carefully slide out the palm rest about one centimeter (less than half an inch).
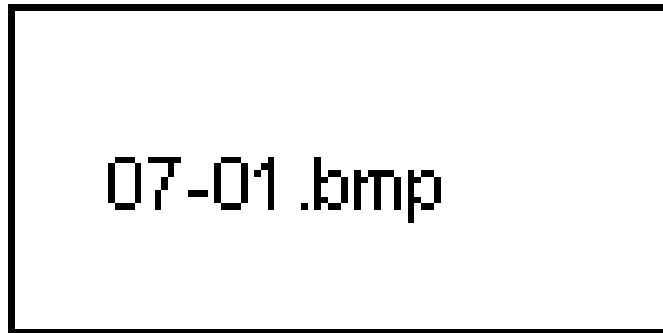
Figure 7-1 Unlatching the palm rest

7. Lift the palm rest up gently to expose the battery pack.

8. Pull up on the plastic tab at the right side of the battery pack to lift the battery pack up slightly. Be careful not to pull too hard or try to lift the battery pack more than about a finger's width.

9. Grasp the battery pack and lift it out.

CAUTION

For environmental reasons, do not throw away a spent battery pack. Please return spent battery packs to your Toshiba dealer.
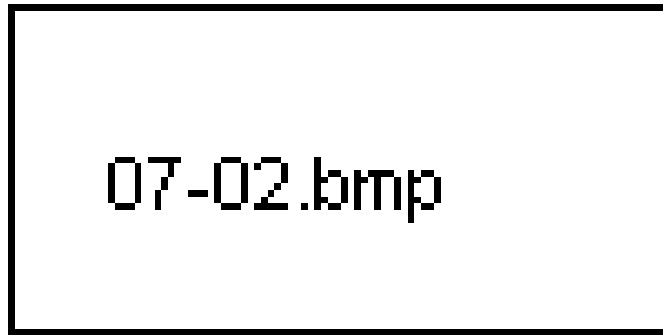
Figure 7-2 Removing the battery pack

Installing the Battery Pack

To install a battery pack, follow the steps below.

CAUTION

> *There is danger of explosion if the battery is incorrectly replaced.*
> *Use only the same or equivalent battery recommended by Toshiba.*
> *Return spent batteries to your dealer for environmentally safe*
> *disposal.*

---

1. Turn the computer's power off.

2. Carefully insert the new or recharged battery pack. Set the grooved end against the battery contacts first, then lay the battery in place. Be sure the end of the plastic tab lies on top of the battery.

CAUTION

> *When you open the palm rest, cables to the AccuPoint buttons are*
> *exposed. Be careful not to apply tension to these cables or to pinch*
> *them when you close the palm rest.*

---

3. Close the palm rest and gently push it into position.

4. Push the latches back into place. Press gently until you feel them click.

5. Turn the computer back on and continue working.

Care of the Power Cord

The computer's internal converter eliminates the need for an external AC adapter, thus enhancing the portability of your computing system. You need only the power cord to run the computer from an AC power source. When carrying the cord, be careful not to fold it too

tightly or to pinch it by the carrying case or other object.

Starting the Computer With the Password

If you registered the password, you must enter the password to start up the computer. If you forget the password, use the password service diskette For more information about how to set a password and make the password service diskette, refer to the *Password security* section in Chapter 11, *Setup and Password Security*.

To start up the computer with the password, follow these steps:

1. Turn on the computer as described in Chapter 4, *Operating Basics* and the following message appears:

   `Password =`

2. Enter the password.

3. Press **Enter**. The computer starts up.

NOTE

If you have set a password and the computer boots by the Alarm Power On function and AutoResume is on, the computer will start with the instant security function enabled. The `password =` *message is not displayed; however, you must enter the password to use the computer.*

If you enter the password incorrectly three times in a row, the computer will halt. In this case turn the power off and back on. Then try again.

If you forget the password, follow these steps:

1. Connect the exlternal 3 1/2" diskette drive and turn on the computer.

2. Insert the password service diskette in the drive. See the *Password security* section in Chapter 11, *Setup and Password Security,* for details on how to create a password service diskette.

NOTE

If the computer is in Resume mode, the password service diskette will not work when you turn on the power. In this case, press the reset button.

3. Press **Enter** and the following message appears.

```
Set Password Again?  (Y/N)
```

Press **Y** to run the TSETUP program and set a new password.

Press **N** to restart the computer.

Power-up Modes

The computer has two operating modes: boot mode and resume mode. You can set the mode by pressing **Fn + F3** to open the Pop-up window and, while holding down **Fn**, pressing **F3** again to change the mode. You can also select the mode by choosing a setting in either the TSETUP program or in MaxTime. See Chapter 11, *Setup and Password Security* for details on setting the power-up mode.

Boot Mode

Boot mode is the standard operating mode for most computers.

In boot mode, the computer performs the following actions when you start the system:

☐ Clears all programs and data from memory.

☐ Runs a memory test and copies the operating system files from the hard disk to RAM.

☐ Executes any commands in your CONFIG.SYS and AUTOEXEC.BAT files.

In boot mode, you must always save your work and exit the application you're using before you turn the computer off. Any work you don't save before shutting the system off is lost.

Starting the computer in boot mode

Follow the steps below to turn on the computer in boot mode.

1. Turn on any peripheral devices connected to the computer.

2. If you have attached an external diskette drive, check that there is no diskette in the drive unless you want to boot from a diskette.

3. Press the power switch on the computer.

When the **Power/Speed** icon lights and all disk activity has stopped, the computer is ready to begin work.

Turning off the computer in boot mode

To turn off the computer in boot mode, follow the steps below.

1. Save your data to the hard disk or to a diskette.

2. Exit the application you are using and, if you are in Windows, exit Windows also.

3. Check the **Disk** icon to make sure all disk activity has stopped.

CAUTION

> *Turning off the computer while it is accessing a disk could damage the disk, the drive or lose data.*

4. Press the power switch and hold it down until the **Power/Speed** icon goes out.

5. Turn off the power to any peripheral devices connected to the computer.

Do not turn the computer back on right away. Wait a few seconds.

AutoResume Mode

One of the T2150CD series computers' most useful features is AutoResume. This feature lets you turn the computer's power off without exiting your software application. When you turn the power on again, you can resume work where you left off, because the screen display is restored as you left it. This saves time and battery power.

NOTE

> *Resume mode is available only with Toshiba's version of MS-DOS and Windows preinstalled on your hard disk.*

With AutoResume enabled, the computer performs the following when you turn the system's

power on:

- ❑ Confirms that resume mode is enabled.

- ❑ Restarts the hard disk.

- ❑ Restores the system, including data in memory, to its state immediately prior to shutdown.

- ❑ Restores the screen display as you left it.

AutoResume does not save your files to a physical disk. It maintains the information in memory so you can start your application without reloading it when you turn the computer on again. It is always a wise precaution, however, to save your work before you turn the computer off.

Turning off the computer in AutoResume mode

To turn off the computer in AutoResume mode, follow the steps below.

1. If you are not sure whether you are in AutoResume mode, you can check by pressing **Fn + F3** to open the Pop-up window. To change the mode, continue holding down **Fn** and press **F3** to change the mode. The current mode is shown in the Pop-up window. You can also use the TSETUP program or MaxTime. See Chapter 11, *Setup and Password Security*.

2. Save your data to the hard disk or to a diskette.

3. Check the **Disk** icon to make sure all disk activity has stopped.

CAUTION

> *Turning off the computer while it is accessing a disk could damage the disk, the drive or lose data.*

4. Press the power switch and hold it down for a couple of seconds. When the computer shuts down in resume mode, it sounds a short beep for each feature or device it deactivates.

5. Turn off the power to any peripheral devices connected to the computer.

Do not turn the computer back on right away. Wait a few seconds.

Starting the computer in AutoResume mode

To start the computer in AutoResume mode, follow the steps below.

1. Turn on any peripheral devices connected to the computer.

2. Press the power switch and hold it down until the **Power/Speed** icon goes out.

The display will show the same screen that appeared when you turned off the power. If you experience any difficulties with AutoResume, refer to the sections *AutoResume precautions* and *AutoResume error conditions*, which follow in this chapter.

Automatic Enabling of AutoResume

The system automatically shuts down if the battery pack becomes completely discharged and the AC power cord is not supplying power. When this occurs, the computer first enables AutoResume if you haven't already enabled it through TSETUP or hotkey entry **Fn + F3**.

Follow the steps below to recover from an automatic shutdown:

1. Replace the battery pack or plug in the AC power cord.

2. Wait a few moments before you turn the power on again.

If the backup battery did not completely discharge, the system operates as if it were not shut down.

CAUTION

> *If you are unable to replace the battery pack or connect the AC power cord to the system before the backup battery completely discharges, your data is lost.*

Remember these points when using AutoResume:

- ❑ Do not turn the power off if the **Disk** icon is on.

- ❑ Do not remove the battery pack while the computer is on, unless the AC power cord is powering the computer. If you do, the screen clears, power turns off, AutoResume fails and data in memory is lost.

- ❑ Do not turn power off while a printer, modem or serial device is connected and in operation.

- ❑ AutoResume may not work properly if you run programs that do not use the computer's Basic Input/Output System (BIOS). (For example, some game programs bypass the computer's BIOS.)

AutoResume Error Conditions

If a problem occurs with AutoResume, the following message appears when you turn the computer on:

```
WARNING: RESUME FAILURE.

PRESS ANY KEY TO CONTINUE.
```

Press any key to restart the system. The computer reinitializes RAM and resets all soft keys.

The resume failure message may be caused by one or more of these conditions:

☐ The backup battery and the battery pack are completely discharged, and the system is not receiving power through the AC power cord.

☐ You turned off the power while the system was accessing a disk drive.

☐ You removed the battery pack while operating the computer without the AC power cord connected.

☐ You turned off the power while the system was sending or receiving data through a serial port.

☐ You're running a program that does not use the T2150CD series computer's BIOS.

Panel Power On/Off

You can set up your T2150CD series computer so that power turns on automatically when you open the display panel and turns off when you close it.

Refer to Chapter 11, *Setup and Password Security*, for an explanation of how to enable this convenient feature.

System Auto Off

This feature turns the system off automatically if it is not used for a set duration.

Refer to Chapter 11, *Setup and Password Security*, for an explanation of how to set the duration.

Alarm Power On

This feature lets you set a time for the system to turn on automatically.

Refer to Chapter 11, *Setup and Password Security*, for an explanation of how to set the power on timing.

Display Panel

The T2150CD series computers are equipped with either a color advanced STN Liquid
Crystal Display (LCD) or a color TFT LCD display.

This chapter explains functions of color displays, external monitors and the display controller.

Displaying Images

Images are formed on the display by dots called pixels. Each dot can be turned on to emit
light or turned off to appear dark. On the T2150CDS STN screen images are created by the
contrast of light and dark pixels and color filters. On the T2150CDT TFT screen images are
created by various intensities of red, green and blue subpixels.

Figure 8-1 Forming images with pixels and pels

❑ **Pixels** are the smallest visual element on the screen. They are single points of light that
can be turned on or off.

T2150CDS: A pixel on an STN (Super Twisted Nematic) LCD is either light (on) or
dark (off). Color images are achieved by the use of color filters to generate and mix the
three primary additive colors: red, green and blue.

T2150CDT: The color TFT (Thin-Film Transistor) LCD uses transistors attached to
each pixel to turn precisely selected red, green and blue subpixels on or off and to adjust
their brightness, thereby providing a display with superior sharpness, precise color
definition and wide viewing angle.

❑ **Pels** are the smallest visual elements that can be controlled by software. They may be
either one pixel or a group of pixels. The pel size determines the screen resolution (clarity
of detail): the larger the pel the lower the resolution.

Display Controller

The display controller is a hardware controller that formats information for the screen to display. For example, it interprets a software command to turn a particular pel on or off into hardware commands that address the specific pixels required to execute the software command.

The T2150CD series computers' display controller is an advanced Video Graphics Array (VGA) that provides Super VGA (SVGA) support for the internal LCD and external monitors. The LCD panel displays up to 640 horizontal and 480 vertical pixels, which render 25 lines of standard text 80 characters wide. The T2150CDT displays up to 64K colors and the T2150CDS displays up to 256 colors. A high-resolution external monitor connected to a T2150CD series computer can display up to 1024 horizontal and 768 vertical pixels and up to 64K colors.

The advanced display controller lets you run VGA-compatible software, which includes most popular software.

The T2150CD series is equipped with a local video bus for superior performance of your display. The T2150CD series computers can display on both the internal LCD and external CRT at the same time. You also have the option of displaying on the LCD only or on the CRT only.

The software utilities that come with the T2150CD series computer provide drivers that accelerate Windows graphics and improve performance for both the internal display and an external monitor. Refer to Chapter 10, *Toshiba Utilities and Drivers*, for information on installling the drivers.

Video RAM

The T2150CD series provides 1MB of RAM for video display.

Video Modes

The video mode is controlled by the display controller, which uses industry standard rules to govern the screen resolution and the maximum number of colors that can be displayed on screen. These standard rules are called video modes.

Software written for a given video mode will run on any computer that supports the mode. An application's video mode depends on the screen resolution required, the number of colors used, the font size and whether it runs in text or graphics mode.

The T2150CD series computers' display controller supports all VGA and SVGA modes.

There are two basic types of video modes: text mode and graphics mode. Refer to the

Selecting video mode section later in this chapter.

Text Mode

In text mode, each pel is called a character cell, as illustrated below. The display for each cell is limited to a predefined character. Appendix B, *ASCII Character codes* shows the available character set. Also refer to your software's documentation.

Figure 8-2 Character cell

The character cells are arranged in rows and columns. The computer's display supports two text modes:

❑ 80 columns by 25 rows, with each pel containing 64 pixels (8 x 8)

❑ 40 columns by 25 rows, with each pel containing 128 pixels (16 x 8)
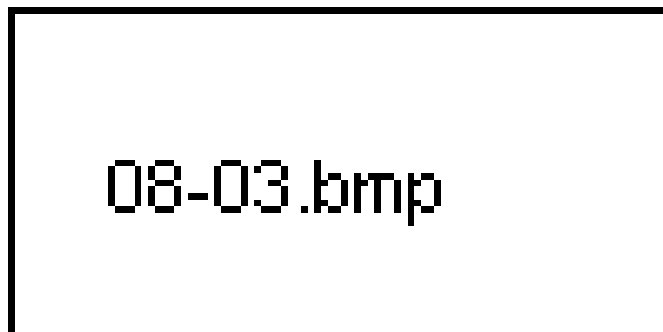
Figure 8-3 Text modes

Graphics Mode

The text mode in MS-DOS is 80 x 25. You can use the MODE command to specify 40-column mode while in MS-DOS (refer to your MS-DOS documentation), but most applications reset the screen mode when they load.

In graphics mode, a pel is not limited to a set of characters. Instead, your software can turn any pel on or off freely. An image produced this way can be a variation of a text character,

such as italics or boldface. Or, it can be a graph, such as a pie chart.
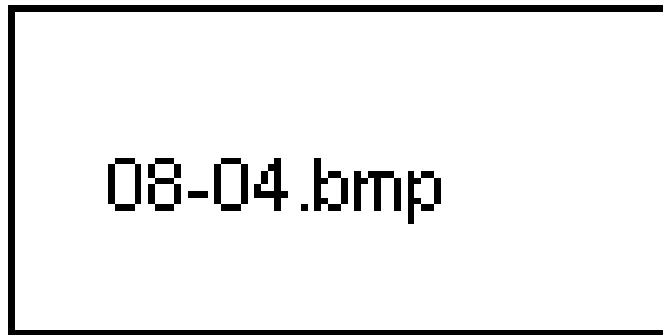
Figure 8-4 Pixels on and off

The 320 x 200 graphics mode deserves special note. In this resolution, each pel consists of four pixels. By turning on and off different numbers of pixels in each pel, the display shows different shades of gray.

Selecting Video Mode

How your software displays information on the LCD depends on the mode it uses. The T2150CD series computer supports a number of video modes, which determine the screen mode (text or graphics), resolution and the number of colors available.

Table 8-1 T2150CDT Video modes

Video mode	Type	Resolution	Character matrix (pels)	T2150CDT LCD colors	CRT colors	CRT vertical refresh rate	CRT horizontal refresh rate
0, 1	VGA Text	40 x 25 Characters	8 x 8	16 of 256K	16 of 256K	70Hz	31.5KHz
2, 3	VGA Text	80 x 25 Characters	8 x 8	16 of 256K	16 of 256K	70Hz	31.5KHz
0*, 1*	VGA Text	40 x 25 Characters	8 x 14	16 of 256K	16 or 256K	70Hz	31.5KHz
2*, 3*	VGA Text	80 x 25 Characters	8 x 14	16 of 256K	16 or 256K	70HZ	31.5KHZ
0+, 1+	VGA Text	40 x 25 Characters	8(9) x 16	16 of 256K	16 of 256K	70Hz	31.5KHz
2+, 3+	VGA Text	80 x 25 Characters	8(9) x 16	16 of 256K	16 of 256K	70Hz	31.5KHz
4, 5	VGA Grph	320 x 200	8 x 8	4 of 256K	4 of 256K	70Hz	31.5KHz

		Pels					
6	VGA Grph	640 x 200 Pels	8 x 8	2 of 256K	2 of 256K	70Hz	31.5KHz
7	VGA Text	80 x 25 Characters	8(9) x 14	Mono	Mono	70Hz	31.5KHz
7+	VGA Text	80 x 25 Characters	8(9) x 16	Mono	Mono	70Hz	31.5KHz
D	VGA Grph	320 x 200 Pels	8 x 8	16 of 256K	16 of 256K	70Hz	31.5KHz
E	VGA Grph	640 x 200 Pels	8 x 8	16 of 256K	16 of 256K	70Hz	31.5KHz
F	VGA Grph	640 x 350 Pels	8 x 14	Mono	Mono	70Hz	31.5KHz
10	VGA Grph	640 x 350 Pels	8 x 14	16 of 256K	16 of 256K	70Hz	31.5KHz
11	VGA Grph	640 x 480 Pels	8 x 16	2 of 256K	2 of 256K	60 Hz	31.5 KHz
12	VGA Grph	640 x 480 Pels	8 x 16	16 of 256K	16 of 256K	70 Hz	31.5 KHz
13	VGA Grph	320 x 200 Pels	8 x 8	256 of 256K	256 of 256K	70 Hz	31.5 KHz
20	SVGA Grph	640 x 480 Pels	8 x 16	16 of 256K	16 of 256K	60 Hz	31.5 KHz
22	SVGA Grph	800 x 600 Pels	8 x 8	16 of 256K	16 of 256K	60 Hz	37.5 KHz
24	SVGA Grph	1024 x 768 Pels	8 x 16	16 of 256K	16 of 256K	60 Hz	48.5 KHz
30	SVGA Grph	640 x 480 Pels	8 x 16	256 of 256K	256 of 256K	60 Hz	31.5 KHz
32	SVGA Grph	800 x 600 Pels	8 x 16	256 of 256K	256 of 256K	60 Hz	37.5 KHz
34	SVGA Grph	1024 x 768 Pels	8 x 16	256 of 256K	256 of 256K	60 Hz	48.5 KHz
40	SVGA Grph	640 x 480 Pels	8 x 16	32K of 32K	32K of 32K	60 Hz	31.5 KHz
41	SVGA	640 x 480	8 x 16	64K of	64K of	60 Hz	31.5 KHz

	Grph	Pels		64K	64K		
78	SVGA Grph	640 x 400 Pels	8 x 16	256 of 256K	256 of 256K	60 Hz	31.5 KHz

Table 8-2 T2150CDS Video modes

Video mode	Type	Resolution	Character matrix (pels)	T2150CDT LCD colors	CRT colors	CRT vertical refresh rate	CRT horizontal refresh rate
0, 1	VGA Text	40 x 25 Characters	8 x 8	16 of 222K†	16 of 256K	70 Hz	31.5KHz
2, 3	VGA Text	80 x 25 Characters	8 x 8	16 of 222K†	16 of 256K	70 Hz	31.5KHz
0*, 1*	VGA Text	40 x 25 Characters	8 x 14	16 of 222K†	16 of 256K	70 Hz	31.5KHz
2*, 3*	VGA Text	80 x 25 Characters	8 x 14	16 of 222K†	16 of 256K	70 Hz	31.5KHz
0+, 1+	VGA Text	40 x 25 Characters	8(9) x 16	16 of 222K†	16 of 256K	70 Hz	31.5KHz
2+, 3+	VGA Text	80 x 25 Characters	8(9) x 16	16 of 222K†	16 of 256K	70 Hz	31.5KHz
4, 5	VGA Grph	320 x 200 Pels	8 x 8	4 of 222K†	4 of 256K	70 Hz	31.5KHz
6	VGA Grph	640 x 200 Pels	8 x 8	2 of 222K†	2 of 256K	70 Hz	31.5KHz
7	VGA Text	80 x 25 Characters	8(9) x 14	Mono	Mono	70 Hz	31.5KHz
7+	VGA Text	80 x 25 Characters	8(9) x 16	Mono	Mono	70 Hz	31.5KHz
D	VGA Grph	320 x 200 Pels	8 x 8	16 of 222K†	16 of 256K	70 Hz	31.5KHz
E	VGA Grph	640 x 200 Pels	8 x 8	16 of 222K†	16 of 256K	70 Hz	31.5KHz
F	VGA Grph	640 x 350 Pels	8 x 14	Mono	Mono	70 Hz	31.5KHz

10	VGA Grph	640 x 350 Pels	8 x 14	16 of 222K†	16 of 256K	70 Hz	31.5KHz
11	VGA Grph	640 x 480 Pels	8 x 16	2 of 222K†	2 of 256K	60 Hz	31.5KHz
12	VGA Grph	640 x 480 Pels	8 x 16	16 of 222K†	16 of 256K	70Hz	31.5KHz
13	VGA Grph	320 x 200 Pels	8 x 8	256 of 222K†	256 of 256K	70Hz	31.5KHz
20	SVGA Grph	640 x 480 Pels	8 x 16	16 of 222K†	16 of 256K	60Hz	31.5KHz
22	SVGA Grph	800 x 600 Pels	8 x 8	16 of 222K†	16 of 256K	60Hz	37.5KHz
24	SVGA Grph	1024 x 768 Pels	8 x 16	16 of 222K†	16 of 256K	60Hz	48.5KHz
30	SVGA Grph	640 x 480 Pels	8 x 16	256 of 222K†	256 of 256K	60Hz	31.5KHz
32	SVGA Grph	800 x 600 Pels	8 x 16	256 of 222K†	256 of 256K	60Hz	37.5KHz
34	SVGA Grph	1024 x 768 Pels	8 x 16	256 of 222K†	256 of 256K	60Hz	48.5KHz
40	SVGA Grph	640 x 480 Pels	8 x 16	N/A	32K of 32K	60Hz	31.5KHz
41	SVGA Grph	640 x 480 Pels	8 x 16	N/A	64K of 64K	60Hz	31.5KHz
78	SVGA Grph	640 x 400 Pels	8 x 16	256 of 222K†	256 of 256K	60Hz	31.5KHz

† The default setting is 222K colors, but you can select 4096 or 222K colors using TSETUP.

Tables 8-1 and 8-2 show all the video modes supported by the computer. The mode numbers are generally used by programmers to identify the respective modes. If your application asks you to select a mode by number, the choices it offers may not match the numbers on the table. In such cases, make your selection based on resolution, font grid (number of pixels per character or pixels per pel) and number of colors.

Your software may let you choose a screen mode and/or video mode. Some applications let you make your selection when you install the software; others provide a menu within the package to use while you are in the program. Your selection remains valid until you exit the

program or until you (or your program) specify a different video mode.

There is no danger in selecting different video and screen modes. Try different color settings until you're satisfied with the result. Many applications make it easy for you to experiment. You may find the following points helpful in making your selection:

❑ For software that supports only text modes, 80 columns x 25 lines displays twice as much information as 40 columns x 25 lines (2,000 characters and 1,000 characters, respectively). Some software also supports 132 columns x 43 lines, or even 132 columns x 50 lines.

❑ If your software supports both graphics and text modes, the screen display may appear to operate faster using a text mode.

❑ The LCD's highest graphics resolution is 640 columns x 480 lines.

Displaying Colors

The T2150CDT's TFT panels can display up to 16 colors out of a possible 256K colors in text mode. In graphics mode, the panels can display 256 colors out of a possible 256K colors and 32K/64K colors. The T2150CDS's STN panels can display in 16 colors out of a possible 4096/222K in text mode and in graphics mode they can display 256 colors out of a possible 4096/222K colors.

Some software packages have a setup program that requires you to choose a graphics mode. When you choose a mode, consider the following:

❑ The T2150CD series's VGA compatible controller allows the software to make full use of the VGA controller's capabilities.

In 640 x 200 mode, the LCD display forms each pel from two pixels.

In 320 x 200 mode, the LCD display forms each pel from four pixels arranged in a square.

❑ If you are using a VGA compatible analog external monitor, up to 256 colors, out of the maximum 256K colors, may be displayed simultaneously. The T2150CDT also has display modes for 32K out of 32K colors and 64K out of 64K colors.

Using an External Color Monitor

The T2150CD series computers support VGA and Super VGA video modes. You can use a high-resolution monitor connected to the external monitor port on the computer or to the external monitor port on an optional port replicator. See Chapter 12, *Optional Devices*, for information on connecting an external monitor and a port replicator.

When you connect an external monitor and turn on the computer's power the computer automatically recognizes the monitor and determines whether it is color or monochrome.

You do not have to make any settings to use an external monitor. However, you can select from the following options:

❑ External monitor only

❑ Internal LCD only

❑ Simultaneous display on the external monitor and internal LCD

The TSETUP program has two options `Simultaneous` and `Internal/External`. If you select `Simultaneous`, displays appear on the internal LCD and external monitor at the same time. If you select `Internal/External`, press hotkey combination **Fn + F5** to change from internal LCD to external monitor to simultaneous.

CAUTION

> *Do not press* **Fn + F5** *under the following conditions:*
>
> 1. *While running data communications, an error could occur. Wait for completion of the data transfer.*
>
> 2. *While running a DOS session under Windows, the screen will be blanked. If you do press* **Fn + F5** *in a DOS session, type* **exit** *to return to Windows.*

Memory

Optimal memory configuration can greatly enhance the performance of your computer. The T2150CD series computers provide several tools for customizing memory configuration to best suit your software and system. This chapter introduces memory concepts and explains how to configure memory, and how to create and use various memory devices such as RAMDRIVEs.

Types of Memory

The computer uses two types of physical memory components: Read-Only Memory (ROM) and Random Access Memory (RAM). The term "memory" refers to RAM unless specified otherwise.

ROM

ROM is non-volatile, read-only memory. This means the data in ROM is not deleted when the computer is turned off, and it cannot be changed (written to). The data can only be read.

The computer contains 128KB of ROM, including 64KB of ROM for the Basic Input/Output System (BIOS), which contains start-up instructions, and 40KB of video BIOS ROM, which controls display operation.

ROM provides permanent storage for the BIOS and the instructions that start the computer (the bootstrap leader). This data is permanently stored and does not require power to be retained.

RAM

RAM is volatile, read/write memory. This means the data in RAM is deleted when you turn off the computer. The T2150CDS comes with 4MB of internal RAM expandable with 4, 8, 16 or 24MB memory cards to 8, 12, 20 or 28MB. The T2150CDT comes with 8MB of RAM expandable to 12, 16 or 24 or 32MB.

You can store data in RAM as well as read information from it. Because RAM is volatile, you lose all information stored in RAM when you turn off the computer or experience a power failure.

Unlike ROM which performs functions determined by the manufacturer, RAM can be altered by the user. You can add RAM capacity and configure RAM to optimize the performance of your software. The next section describes the functions and configuration of RAM.

Using RAM

Manufacturers of personal computers have adopted the following names to describe the functions of various parts of RAM:

- ❑ Conventional memory
- ❑ Upper memory
- ❑ High memory
- ❑ Extended memory
- ❑ Expanded memory

The following memory map shows how RAM is allocated.

Memory Map

This diagram illustrates how your computer allocates memory. Although memory size is referred to in thousands of bytes (characters), or in kilobytes, the actual quantities are slightly larger. This is because a kilobyte is actually 1,024 bytes (2^{10}), not 1,000 bytes. Memory measurements are usually rounded off to simplify discussion.

memmap.bmp

Conventional Memory

MS-DOS can directly access only 1 megabyte (1024 kilobytes) of memory at a time. This is the area between 0KB and 1MB on the memory map. The first 640 kilobytes in this area is called conventional memory.

Conventional memory is used as a work area by MS-DOS and most application software.

Extended BIOS Data Area

This is 1KB of RAM loaded at 639KB. It is used to support extended BIOS functions including support for PS/2 pointing devices.

Upper Memory

The next 384KB is reserved for I/O device drivers, certain application functions and other uses. Access to this area is possible only with a special memory driver such as MS-DOS's EMM386.EXE driver. By adding the line `dos=umb` to your CONFIG.SYS file, you can load device drivers and programs into the Upper Memory Block (UMB). Refer to your DOS documentation for details.

High Memory

The High Memory Area (HMA) is the first 64KB of extended memory (explained below). You can save some conventional memory by loading the operating system into HMA. If you are using Toshiba MS-DOS add the line `dos=high` to your CONFIG.SYS file. Refer to your DOS documentation for details.

Extended Memory

Extended memory is the area on the memory map above 1MB.

Since MS-DOS cannot directly access extended memory, you cannot use it directly to run MS-DOS programs. However, you can configure all or part of extended memory as expanded memory. In addition, you can use conventional, expanded and extended memory as a RAMDRIVE.

The computer uses 192KB of extended memory for Shadow BIOS ROM. When you turn on your computer, the BIOS copies itself from the flash ROM to the Shadow BIOS area. Accessing the BIOS from the Shadow BIOS area is much faster than from flash ROM. You cannot disable Shadow BIOS ROM.

Expanded Memory

Some software packages that run under Toshiba MS-DOS can use memory beyond 640KB as a work area. These applications were designed according to a standard known as Expanded Memory Specification (EMS) which was jointly developed by Lotus, Intel, and Microsoft Corporations. This standard is called LIM-EMS, or expanded memory.

Certain applications require expanded memory to increase their data processing capabilities. For example Lotus 1-2-3 uses expanded memory to provide more space for large spreadsheets. A software application designed for LIM-EMS can automatically use the RAM you assign to expanded memory.

The computer supports LIM-EMS by emulating it in extended memory with the help of the 386 and 486 microprocessor's special feature, virtual 86 mode.

You do not need any optional hardware devices or hardware settings to support LIM-EMS

on your computer. However, to use LIM-EMS, the EMM386.EXE and HIMEM.SYS drivers must be assigned in your CONFIG.SYS file as described below.

LIM-EMS and Software

Expanded memory requires two things for use:

❑ The application you use must conform to the LIM-EMS standard.

To determine if your software can take advantage of expanded memory, refer to your software documentation. The manual should tell you clearly if your package can use expanded memory and may even tell you which version(s) of LIM-EMS it supports.

❑ Your CONFIG.SYS file must contain the HIMEM.SYS extended memory driver and the expanded memory driver EMM386.EXE. These programs control (drive) access to expanded memory.

The following is an example of a CONFIG.SYS file with the extended memory driver in the fourth line and the expanded memory driver in the fifth line:

```
buffers = 30

files=30

device=c:\dos\setver.exe

device=c:\dos\himem.sys

device=c:\dos\emm386.exe

dos=high
```

LIM-EMS and Optional Additional Memory

T2150CD series computers come with 4096KB or 8192KB of RAM memory. If you plan to use large spreadsheets or process complicated graphics, you may want to expand the computer's memory capacity by installing optional memory cards. Refer to Chapter 12, Optional Devices for more information about these cards.

RAMDRIVE

You can further enhance the performance of your computer by creating an MS-DOS RAMDRIVE, which simulates a physical disk using RAM. With no moving parts, a RAMDRIVE is much faster than a diskette or hard disk and it saves battery power. Loading programs or frequently accessed data files into a RAMDRIVE speeds up your software.

The MS-DOS RAMDRIVE feature lets you create a RAM disk from 4KB up to the total amount of available memory. RAMDRIVEs are supported by the AutoResume feature.

A RAMDRIVE is volatile. So you must save data in it to a diskette or hard disk before you turn off or reset your computer. Enabling the AutoResume feature will save data in a RAMDRIVE when the power is turned off. However, even with AutoResume, if you reset your computer with the reset button or with **Ctrl + Alt + Del**, your data will be lost. See your MS-DOS documentation for details on setting up a RAMDRIVE.

CPU Cache Memory

You can use the Setup program to enable or disable the 16KB cache integrated into the DX4 processor. The cache saves frequently used instructions for instant access, which can speed up your system's performance. Some older software does not run well on a high-speed system. In this case, disabling the cache may improve performance.

NOTE

> *If you set the processing speed to* Low *in the TSETUP program, the CPU cache is automatically disabled.*

Memory Access and Processor Modes

The DX4 processors incorporate features of preceding processors, the 8086, 80286 and 80386. In addition, the DX4 adds special features of its own, which are available through various operating modes.

The following three operating modes can be used:

☐ Real Mode

☐ Protected Mode

☐ Virtual 8086 Mode

As you discover and use new applications that require more memory and more sophisticated system resources, you may find that you need a broader understanding of such concepts as protected mode. The following sections briefly describe each of these modes.

Real Mode

In real mode, the DX4 emulates the programming environment of the 8086 processor. Application programs can access the standard 8086 processor range of memory using "real" physical addresses (hence the name real mode). In real mode, an application can have complete access to the entire address space within the 1MB range, but it cannot access memory above 1MB.

Protected Mode

Protected Mode was introduced with the 80286 microprocessor. The primary advantage of protected mode is its ability to let the processor directly access all available memory.

In protected mode, all the instructions and architectural features are available to the microprocessor, so all applications have access to the full range of extended memory. Another benefit of protected mode is the processor's ability to allocate a predetermined amount of memory to different applications and switch among them (multi-tasking). The processor is responsible for protecting each of the applications in the system from one another.

Virtual 8086 Mode

This mode taps the real power of the DX4 processor. Virtual 8086 mode allows the DX4 processor to emulate real mode and still switch to and from protected mode. The processor can load and execute real mode applications (in virtual 8086 mode), then switch to protected mode and load and execute another application that requires access to the full extended memory available. The microprocessor, together with a control program such as Windows, assumes the responsibility of protecting applications from one another.

Toshiba Utilities and Drivers

Toshiba utilities and drivers are preinstalled on your hard disk. This chapter describes the utilities and drivers and provides references to the relevant chapter describing each one.

Be sure you have backed up the utilities and drivers, along with other preinstalled software, onto diskettes.

List of Utilities and Drivers

The following utilities are preinstalled on your hard disk:

❑ TSETUP.EXE (system configuration program) (See Chapter 11, *Setup and Password Security*.)

❑ TDIAGS.EXE (diagnostic program) (See Chapter 13, *Troubleshooting*.)

❑ TOSCDROM.SYS (CD-ROM driver) (Driver installation is explained in this chapter.)

❑ MaxTime.xxx* (System configuration utility for Windows) (See Chapter 11, *Setup and Password Security*.)

❑ Fn-esse* (enables the user to define shortcut keys for Windows) (Execution is explained in this chapter.)

❑ Hardware Setup* (Windows utility corresponding to TSETUP) (See the *SETUP options* section in Chapter 11, *Setup and Password Security* for a description of available settings.)

❑ Toshiba Display Drivers for Windows (enhances the performance of Microsoft Windows) (Loading and unloading procedures are explained in this chapter.)

❑ Mouseware for AccuPoint (controls functions of the AccuPoint and other pointing devices)

❑ Toshiba Card Manager utilities for PCMCIA cards (See the *Card Manager User's Guide* that came with the computer.)

❑ Sound Driver and Audio Accessories (See the *Audio Applications User's Guide* that came with the computer.)

❑ Toshiba Companion Utility (includes BACKUP.EXE, TOSCDROM.SYS, RESTORE.EXE, TSETUP.EXE, TDIAGS.EXE and other utilities.) (You should install these utilities on a separate diskette. See Chapter 3, *Getting Started*.)

The following utility is included in your system BIOS:

Setup and Password Security

This chapter explains how to use TSETUP and MaxTime options to configure the T2150CD series computer. It also describes how to set the power on and instant security password to prevent others from accessing your data.

When you configure the computer with TSETUP, the computer stores your selected values in memory that is backed up by the internal battery powered Real Time Clock (RTC). Each time you start the computer, the configuration remains the same as that of the last setting.

NOTE

> *If the RTC battery fully discharges, configuration data is lost. A checksum error is displayed when you start the computer and the system configuration returns to factory preset values.*

SYSTEM SETUP of TSETUP

SYSTEM SETUP is an option of the executable file TSETUP.EXE, which is stored in the DOS subdirectory on your hard disk.

Accessing SYSTEM SETUP

1. At the MS-DOS prompt, type **TSETUP** and press **Enter**.

    TSETUP displays the SYSTEM SETUP screen.

11-01.bmp
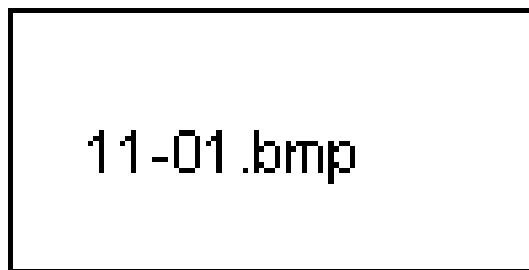
Figure 11-1 The system setup screen

NOTES

> 1. *The T2150CDS comes with standard 4096KB of memory. The* `MEMORY total` *item displays the actual memory installed.*

> 2. *The* `Panel Power On/Off` *item appears only when the*

T2150CD series computer is in Resume mode.

3. *The* `Battery Level` *option appears only when the system cannot detect the battery charge. For example, when the battery is replaced.*

4. *The T2150CDS* `LDC Display Colors` *options are 222k and 4096 colors.*

Changing Values in the SETUP Menu

1. Press ← and → to move between the two columns. Press ↑ and ↓ to move between items in a column.

2. Press either the space bar or **BkSp** to change the value.

Accepting Changes and Exiting SYSTEM SETUP Window

1. Press **End** to accept the changes you made.

   If the changed item does not require the system to reboot, the following message is displayed:

   ```
   Are you sure? (Y/N)
   ```

   If the changed item requires the system to reboot, the following message is displayed:

   ```
       Are you sure? (Y/N)

       The changes you made will cause the system to reboot.
   ```

2. To make other changes, press **N**. Repeat the steps above.

3. To accept the changes, press **Y**.

NOTE

You can press **Esc** *to quit at any time without saving changes. TSETUP asks you to confirm that you don't want to save your changes.*

Factory Preset Configuration

When you access TSETUP, the current configuration is displayed.

1. To show the factory preset configuration, press **Home**.

2. To accept the default settings, press **End** and then press **Y**.

SETUP Options

The **SYSTEM SETUP** screen is divided into functionally related groups. This section describes each group and its options.

Memory

This group provides information on the computer's memory.

Total

This field displays the total amount of memory installed and is automatically calculated by the computer. You cannot change this value.

Base

This field displays the amount of base (conventional) memory, **640KB**, and is automatically calculated by the computer. You cannot change this value.

Extended Memory

This field displays the amount of extended memory the computer has available. You cannot change this value.

Shadow BIOS ROM

This field displays 192KB of RAM, which is reserved for the Shadow BIOS ROM. The value cannot be changed.

Display

This group of options helps you configure the computer's display.

Display Adaptor

This field displays the internal controller for the VGA internal display. Only **VGA compatible** is displayed. You cannot change it.

LCD Display Mode

The computer's LCD displays text in 80 characters by 25 lines and graphics in 640 by 480 pixels for either `Color` or `Monochrome` mode. Use this option to set the computer's display mode to `Color` or `Monochrome.`

`Color` selects color mode. (This is the default.)

`Monochrome` selects monochrome mode. Some software is displayed better in monochrome mode.

Ext. Scan Mode

Use this option to select interlace or non-interlace mode for an external monitor.

`Interlace` selects interlace mode. (This is the default.)

`Non-Interlace` selects non-interlace mode.

LCD Display Colors

This option indicates the color palette of the internal display when the LCD mode is set to `Color.`

T2150CDT TFT display

`256K Colors` Displays 256 colors out of 262,144 colors. (This value cannot be changed.)

T2150CDS STN display

`222K Colors` Displays 256 colors out of 24,576 colors.

`4096 Colors` Displays 256 colors out of 4096 colors.

NOTE

If the STN screen flickers an `LCD Display Colors` *setting of* `222K Colors`, *select* `4096 Colors`.

Power On Display

This option is used to select the display when booting up.

`Internal/ External` Selects an external CRT if one is connected, otherwise it selects the internal LCD. (This is the default.)

`Simultaneous`	Selects both the internal LCD and the external CRT for simultaneous display.

NOTE

*When starting the computer in Resume mode, the last configuration is remembered. If data does not appear on the display you are using after starting in Resume mode, press **Fn + F5**.*

Text Mode Stretch

Text mode stretch enables a larger display area of 680 x 480 pixels in text mode. Disabling this function, reduces the standard resolution of 640 x 400 pixels.

`Enabled`	enables the text mode stretch feature. (This is the default.)
`Disabled`	disables the text mode stretch feature.

Battery

These options let you set battery save functions for optimum performance or battery power conservation. You can also set the battery charge level when necessary.

Battery Save Mode

This option is used to select `Full Power` or `Low Power` or `User Setting` of the `BATTERY SAVE OPTION`.

`Full Power`   The following shows full power settings.

```
BATTERY SAVE OPTIONS

CPU Sleep Mode      =      Disabled

Display Auto Off    =      Disabled (T2150CDS)

                           30 Min. (T2150CDT)

HDD Auto Off        =      Disabled

System Auto Off     =      Disabled

LCD Brightness      =      Bright
```

`Low Power`   The following shows low power settings.

```
BATTERY SAVE OPTIONS

CPU Sleep Mode       =      Enabled

Display Auto Off     =      03 Min.

HDD Auto Off         =      03 Min

System Auto Off      =      30 Min.

LCD Brightness       =      Semi-Bright
```

NOTE

In boot mode, `System Auto Off` is not displayed.

User Setting   This option, allows you to set the battery save parameters on the sub-window, BATTERY SAVE OPTIONS. When you select this option, the automatic setting feature (**Full Power** or **Low Power**) is disabled and the user-preferred parameters become effective. For details, see *User Setting Options* below.

User Setting Options

The following set of options can be selected in the sub menu of **User Setting**, which is one of the **Battery Save Mode** options.

CPU Sleep Mode

Use this option to enable or disable the CPU sleep function.

Enabled   enables sleep mode

Disabled   disables sleep mode

Display Auto Off

Use this option to disable or set the duration of the display automatic power off function. This function causes the computer to turn the LCD panel's illumination off if you make no entry for the set duration.

Disabled   disables display automatic power off.

xx Min.   automatically turns off power to the LCD panel's illumination if the panel is not used for the duration set. The duration **xx** can be set to 1, 3, 5, 10, 15, 20 or

30 minutes.

HDD Auto Off

Use this option to disable or set the duration of the HDD automatic power off function.

      `Disabled`   disables HDD automatic power off.

      `xx Min.`   automatically turns off power to the hard disk drive if it is not used for the duration set. The duration `xx` can be set to 1, 3, 5, 10, 15, 20 or 30 minutes.

System Auto Off

Use this option to enable or disable the system automatic off function when the power up mode is set to Resume. In Boot mode, this feature is always disabled and therefore not displayed.

      `Disabled`   disables system automatic power off.

      `xx Min.`   automatically turns off power to the system if it is not used for the duration set. The duration xx can be set to 10, 20, 30, 40, 50 or 60 minutes.

LCD Brightness

This option sets the LCD's brightness level.

      `Bright`   sets the LCD to bright.

      `Semi-Bright`   sets the LCD to semi-bright.

Battery Level

When you use the computer for the first time or when you install a new or recharged battery, the charge level is unknown to the system. In this case the Manual Set of Battery Level options will be displayed to enable you to set the charge level to 100%, 75%, 50% or 25%.

```
E XXXXXXXXXXXX    F    100% charge

E XXXXXXXX        F    75% charge

E XXXXX           F    50% charge

E XX              F    25% charge

E  ???            F    Charge is unknown (Displayed in TSETUP)
```

Optional Devices

Optional devices can expand the T2150CD series computer's capabilities and its versatility. This chapter describes connection or installation of the following types of devices:

Cards/Memory

- ☐ PCMCIA cards

- ☐ Memory modules

Power Devices

- ☐ Additional battery pack

- ☐ Battery charger

Peripheral Devices

- ☐ Port replicator

- ☐ Parallel printer

- ☐ External monitor

- ☐ PS/2 mouse

- ☐ PS/2 keyboard

- ☐ International keyboards

- ☐ Security lock

- ☐ Interfacing for serial devices

PCMCIA Cards

The T2150CD series computers are equipped with a PCMCIA (Personal Computer Memory Card International Association) card expansion slot that can accommodate two 5 mm Type II cards or one 10.5 mm Type III PCMCIA card. Any PCMCIA compatible card (manufactured by Toshiba or other vendor) can be installed.

Types of PCMCIA cards include:

- ☐ Card modem

❑   SCSI adapter

❑   Flash memory

❑   Network adapter

Installing the PCMCIA Card

Two PCMCIA connectors are located one above the other on the left side of the computer. Both connectors are accessed from the same slot. You can install two Type II cards, one in each connector, or one Type III card in the bottom connector.

To install a PCMCIA card, follow the steps below.

NOTE

Before you install the PCMCIA card, make sure the computer is in boot mode.

1.   Turn off the computer and set it so that the left side faces you.

2.   Pull open the slot cover.
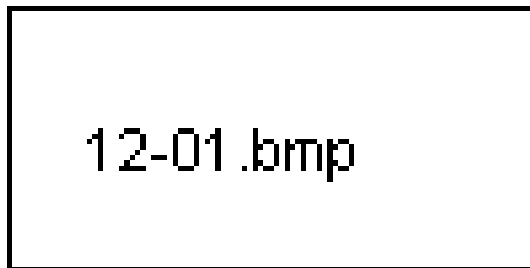
Figure 12-1 Opening the PCMCIA slot's cover

3.   Insert the PCMCIA card as shown in Figure 12-2. When the card is almost fully seated, you will feel some resistance. Press gently to assure a firm connection, but do not force the card into position.
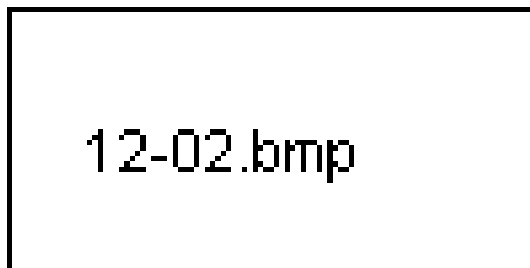
Figure 12-2 Installing the PCMCIA card

4.   When the card is fully seated, an eject button will pop out. Arrows on the buttons

indicate which is for the top connector (left button) and which is for the bottom connector (right button).

5.   Close the cover.

6.   Small flaps in the cover open for each card installed (upper and/or lower) if the card needs to be accessed by, for example, a communication line to a modem or Ethernet adapter. If you need to access the card, simply open the corresponding flap.

12-03.bmp

Figure 12-3 The card's slot cover

After installing the card, check the configuration in the T2150CD series computer's TSETUP program to make sure it is appropriate for your card. Refer to the *Card Manager User's Guide* and to your card's documentation for setup information.

Removing the PCMCIA Card

To remove the PCMCIA card, follow the steps below.

NOTE

Before you remove the PCMCIA card, make sure the computer is in boot mode.

1.   Turn off the computer.

2.   Open the slot cover.

3.   Press the eject button for the card you want to remove. The card will pop out slightly.

4.   Grasp the card and pull it out.

12-04.bmp
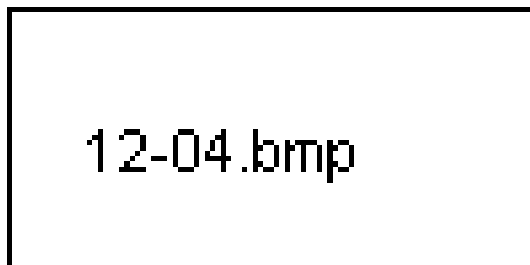
Figure 12-4 Removing the PCMCIA card

5. Close the cover.

Memory Expansion

You can install a memory module in the computer's Small Outline SIMM socket to increase the amount of RAM to a maximum of 28MB in the T2150CDS or 32MB in the T2150CDT. Refer to Chapter 8, *Memory*, for details on configuring your expansion memory.

Installing Memory Module

To install the memory module, carefully follow the instructions below.

1. Remove the main battery. Refer to Chapter 7, *Power and Power-Up Mode*.

2. Make sure the computer is in boot mode, then turn off the power.

CAUTION

       1. Do not try to install a memory module with the computer turned on. You can damage the computer and the module.

       2. Be careful not to drop foreign objects into the computer. Metal objects can cause permanent damage to the computer's circuitry and could possibly result in electric shock.

3. Remove all cables connected to the computer.

4. Turn the computer upside down.

5. Remove two screws securing the memory module socket cover.

6. Slide a thin object under the notch on the cover and rotate the cover up to remove it. Two latches hold the cover in place on the side away from the screws.
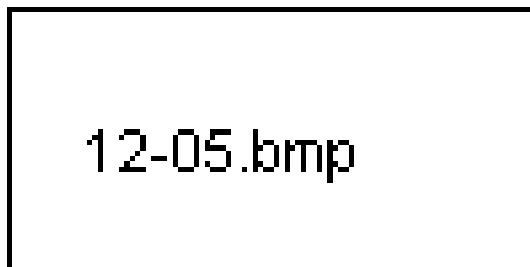
Figure 12-5 Removing the memory module socket cover

7. Insert the memory module, connectors first, into the computer's connectors. Note the notch at the corner of the module. This notch should be on the right as you insert the connectors. See Figure 12-6.
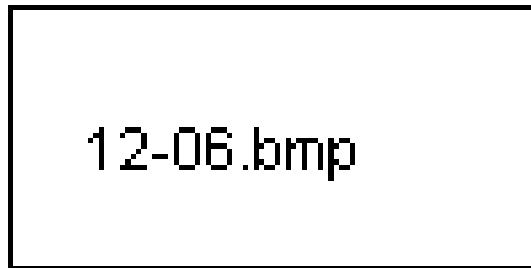
Figure 12-6 Inserting the memory module

8. The module is held up by springs in the computer's socket. Gently push the module into place until two latches close over each side.

9. Fit the socket cover's latches into place and seat the cover.

10. Secure the two screws.

11. When you turn the computer on, it should automatically recognize the total memory capacity. Verify that the added memory is recognized.

Removing Memory Module

To remove the memory module, make sure the computer is in boot mode then:

1. Remove the battery and turn the computer off. Refer to Chapter 7, *Power and Power-Up Modes*.

2. Remove all cables connected to the computer.

3. Turn the computer upside down.

4. Remove two screws securing the memory module socket cover.

5. Slide your fingernail or a thin object under the notch on the cover and rotate the cover up to remove it. Two latches hold the cover in place on the side away from the screws.

6. Two latches on each side of the module hold it in place. Press these to the outside to release the module. The side of the module away from the connectors will spring up. See

Figure 12-7.
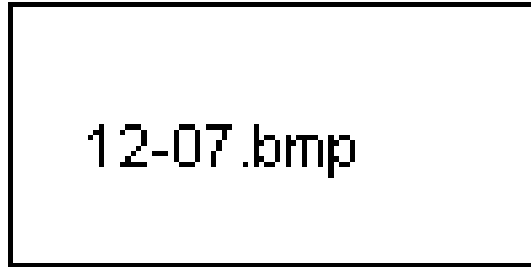
Figure 12-7 Removing the memory module

7. Fit the cover's latches into place and seat the cover.

8. Secure the two screws

Additional Battery Pack

You can increase the portability of the computer with additional battery packs. If you're away from an AC power source and your battery is running low, you can replace it with a freshly charged battery. See Chapter 7, *Power and Power-Up Modes*.

Battery Charger

The battery charger provides a convenient way to charge extra batteries outside the computer. The time required for charging is about the same using the battery charger or using the AC power cord connected to the computer.

Port Replicator

In addition to the ports available on the T2150CD series computer, a port replicator provides an audio line-out jack and PS/2 mouse and joystick ports. The port replicator connects directly to the port replicator port on the back of the computer so no cabling is necessary. An AC adapter, included with your port replicator, connects to the port replicator to a power source.

Ports for connecting the following devices are available on the port replicator. Information on connecting each device is found later in this chapter.

- ❑ External monitor

- ❑ Parallel printer

- ❑ Serial devices

- ❑ PS/2 mouse

- ❑ PS/2 keyboard

- ❑ DC IN socket for the AC adapter

- ❑ Security lock slot

- ❑ External diskette drive

- ❑ Joystick

- ❑ Audio line-in, line-out jacks

- ❑ Headphone jack

- ❑ Volume control

Front

Figure 12-8 shows the port replicator's front.
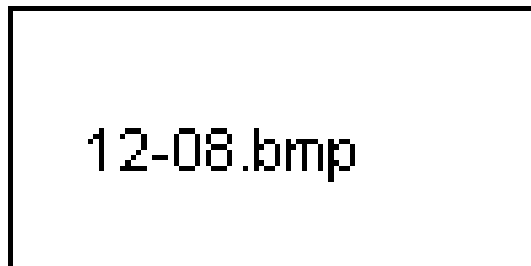
Figure 12-8 The front

Computer connector	This is the computer interface. It connects directly to the T2150CD series computer's port replicator port.
Connecting lever	This lever assures proper connection between the port replicator and computer when the computer is aligned on the port replicator's plastic guide pins.
Guide pins	These pins insert into holes on the bottom of each rear corner of the computer and guide the computer to a proper connection with the port replicator.
Metal latches	These latches engage slots on the bottom of the

computer to hold it securely to the port replicator.

Back

Figure 12-9 shows the port replicator's back.

12-09.bmp

Figure 12-9 The back

DC IN   The AC adapter's DC outlet plug connects to this
socket. Use only the AC adapter that came with your
dcin.bmp   port replicator. Using the wrong adapter can damage
the computer. It replaces the computer's DC IN
socket.
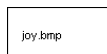
Joystick   This port enables connection of a joystick for use with
games or other specialized software.
joy.bmp

Parallel port   Use this Centronics-compatible, 25-pin parallel port
to connect a parallel printer or other parallel device. It
prntport.bmp   replaces the computer's parallel port.
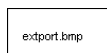
External monitor   This 15-pin port lets you connect an external video
monitor. Note that the AutoResume feature is effective
extport.bmp   with an external monitor.
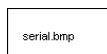
Serial port   Use this 9-pin port to connect serial devices such as
an external modem, serial mouse or serial printer. It
serial.bmp   replaces the computer's serial port.
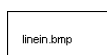
Line-in   A standard 3.5 mm mini line-in jack enables
connection of a stereo device for audio input.
linein.bmp
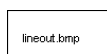
Line-out   A standard 3.5 mm mini line-out jack enables
connection of a stereo device for audio output.
lineout.bmp

PS/2 keyboard	Use this port to connect a PS/2 keyboard.

pskeyprt.bmp

PS/2 mouse	Use this port to connect a PS/2 compatible pointing device.

ps2mouse.bmp
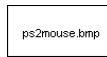
Ground	The ground screw is used to attach a grounding cable to protect the computer against a telephone line power surge when a card modem is installed.

ground.bmp

Security lock slot	This slot lets you attach a security cable to the port replicator to deter theft. Attach one end of the cable to the port replicator and the other end to a desk or other large object.

lockslot.bmp
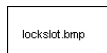
Right Side

Refer to Figure 12-8 for the location of items on the port replicator's right side.

External diskette drive	An external 3 1/2" diskette drive accommodates both 1.44MB double-sided, high-density, double-track (2HD) and 720KB double-sided, double-density, double-track (2DD) disks. The computer's external diskette drive port can also be accessed, but only one of the ports can be used.
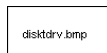
disktdrv.bmp

Headphone jack	A standard 3.5 mm mini line-out jack enables connection of a stereo headphone (80 ohm minimum) or other device for audio output. When you connect headphones, the internal speaker is automatically disabled.

speaker.bmp
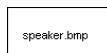
Volume control	Use this dial to adjust the headphone volume.

volctrl.bmp

Connecting the Port Replicator

The port replicator is designed to assure a secure connection by a few simple operations.

To connect the port replicator, follow the steps below.

1. Turn off the computer.

2. Disconnect any peripheral devices connected to the computer.

3. Lift up the connecting lever on top of the port replicator.
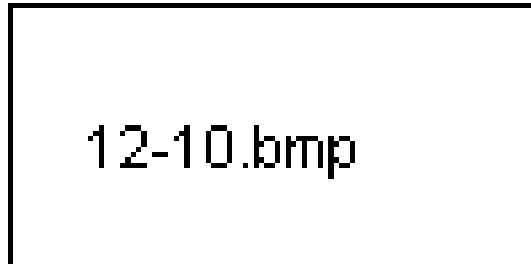
Figure 12-10 Lifting up the connecting lever

4. Seat the computer onto the port replicator's guide pins. Be sure holes on each back corner of the computer's underside fit onto the pins.
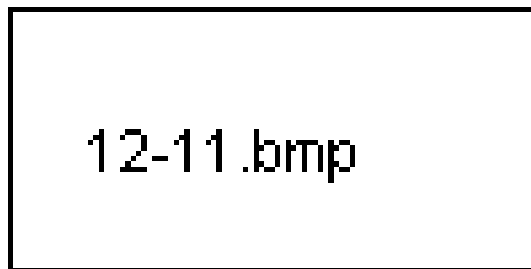
Figure 12-11 Positioning the computer on the port replicator

5. Press the port replicator's connecting lever down fully to its original position to complete the connection.

NOTE

When you close the lever, the cover to the computer's port replicator port automatically opens, the port replicator's connector engages with the computer's port replicator port, and metal latches on the port replicator engage notches on the bottom of the computer to hold the connection securely.
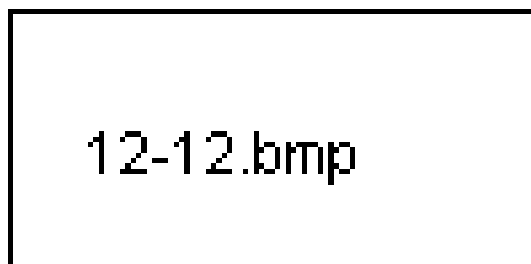
Figure 12-12 Completing the connection

Connecting the AC Adapter

To supply power to the computer, connect the AC adapter as described below.

1. Attach the power cord to the AC adapter.

2. Plug in the AC adapter cable.

12-13.bmp
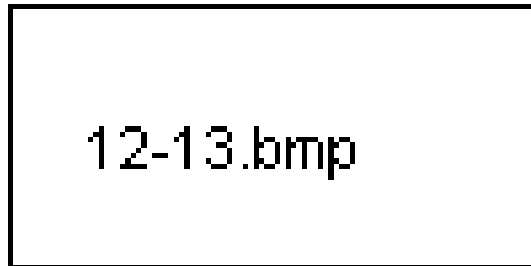
Figure 12-13 Connecting the AC adapter

Disconnecting the Port Replicator

To disconnect the port replicator, follow the steps below.

1. Turn off the computer.

2. Lift up the port replicator's connecting lever.

12-14.bmp
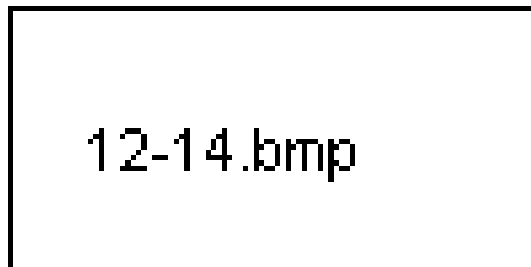
Figure 12-14 Lifting up the connecting lever

3. Lift off the computer.

4. Pull out the computer's interface cover and close it.

Parallel Printer

You can connect any standard Centronics-compatible parallel printer to your computer. All you need is an IBM PC parallel printer cable. Your dealer can supply one or you can purchase one at most computer stores.

The cable's connectors are designed so that it is impossible for you to connect them incorrectly. You can also connect a parallel printer to an optional port replicator. See the *Port replicator* section in this chapter. To connect a printer, follow these steps:

1. Turn off the computer.

2. Insert one end of the cable into the Parallel port on the back of the computer.

3. Tighten the screws that fasten the cable connector to the computer's Parallel port.

4. Insert the other end of the cable into the printer's parallel connector.

5. Fasten the connector to the printer with the clips on the parallel port.

6. Turn on the printer.

7. Turn on the computer.

8. Switch to the directory that contains your MS-DOS files (for example, c:\DOS).

9. Type **TSETUP** and press **Enter**.

10. Select `Parallel Port` and the `OPTION` subwindow will open to let you select the mode. Set the mode to `Output.`

11. Press **End** to accept the changes and reboot.

    SYSTEM SETUP displays:

    `Save settings, perform self test and reboot? (Y/N)`

12. Press **Y**.

The computer restarts and automatically recognizes the printer.

External Monitor

An external analog monitor can be connected to the monitor port on the computer or optional port replicator. To connect a monitor, follow the steps below. See the *Port replicator* section in this chapter for directions on connecting a port replicator.

NOTE

> *The AutoResume feature can be used with an external monitor. Simply enable AutoResume and the computer will maintain the data as it is displayed on the external monitor.*

1. Turn the computer off.

2. Connect the monitor to the external monitor port.

3. Turn the monitor's power on.

4. Turn the computer on.

The computer automatically recognizes the external monitor and sends output to it.

If you have selected `Simultaneous` under the `Display` options of the TSETUP program, both the external monitor and the internal LCD will be active when you turn on the computer. If `Internal/External` is selected, only the external monitor will be active.

To change the display settings, press **Fn + F5.** If you disconnect the monitor before you turn the computer off, be sure to press **Fn + F5** to switch to the internal display.

PS/2 Mouse

Use the PS/2 mouse port on the optional port replicator to connect a PS/2 mouse. See the *Port replicator* section in this chapter for directions on connecting the port replicator.

Make sure you have a cable that has a 6-pin connector for the port replicator's mouse port. If the mouse's cable is not compatible, see your dealer for an adapter cable.

NOTE

> *How the computer treats the connection to a PS/2 mouse depends on the setting for `Pointing Devices` under the `Others` options in the Setup program. If `Simultaneous` is selected, you can operate both the AccuPoint and the PS/2 mouse. If `Auto Selected` is chosen, the AccuPoint is disabled when a PS/2 mouse is connected.*

To connect a PS/2 mouse:

1. Turn the computer off.
2. Connect the PS/2 mouse to the PS/2 mouse port.
3. Before turning on the computer connect the mouse, pressing gently to assure a firm connection. If you connect the mouse while the computer is on, you will have to reboot for the computer to recognize the mouse connection.

To disconnect the mouse, turn off the computer and pull out the mouse connector.

Consult your mouse manual for instructions on how to install necessary software.

If you have a serial mouse, refer to *Connecting a serial mouse* in the section, *Interfacing for serial devices*, later in this chapter.

PS/2 Keyboard

Use the PS/2 keyboard port on the computer or optional port replicator to connect a PS/2 keyboard. See the *Port replicator* section in this chapter for directions on connecting the port replicator. To connect a PS/2 keyboard:

1. Turn the computer off.

2. Plug the PS/2 keyboard connector into the PS/2 keyboard port on the computer or port replicator.

3. Before turning on the computer, connect the keyboard to the port replicator, pressing gently to assure a firm connection. If you connect the keyboard while the computer is on, you will have to reboot for the computer to recognize the keyboard connection.

NOTE

> *When an external keyboard is connected, the internal keyboard is disabled.*

To disconnect the keyboard, turn off the computer and pull out the keyboard connector.

International Keyboards

Eight international keyboards are available for the T2150CD series computers. The 82-key U.S. English keyboard must be replaced with an 84-key keyboard in order to fit the international key cap sets. If you have the 84-key U.K. English keyboard, only new key caps are necessary.

To replace a key cap, grip the cap with the supplied key cap remover and pull straight up as shown in the following figure. Next, squarely place the new key cap on the proper connector and firmly press it until the cap snaps into place.
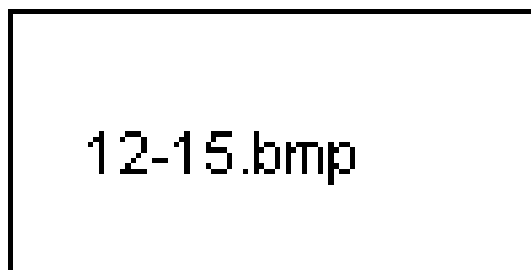
Figure 12-15 Replacing a key cap

Appendix C shows the international keyboard layouts with the new key caps in place.

Security Lock

A security lock enables you to anchor your computer and an optional port replicator to a desk or other heavy object to help prevent unauthorized removal of the computer or port replicator.

Attach one end of a cable to the desk and the other end to the security lock slot on the left side of the computer and to the optional port replicator as shown below.
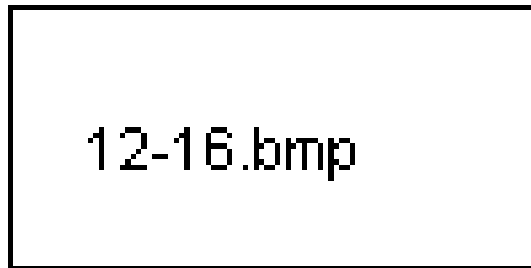
Figure 12-16 Security lock

Interfacing for Serial Devices

The term serial interfacing refers to information being transmitted to a device sequentially, one bit at a time, rather than in parallel, one byte (eight bits) at a time.

RS-232-C is the most common serial interfacing standard in the microcomputer industry. The computer can use most serial devices that meet this standard. See Chapter 2, *The Grand Tour,* for the location of the serial port. Serial devices can also be connected to an optional port replicator. See the *Port replicator* section in this chapter.

A serial port's I/O address and interrupt request level are related to hardware configuration. The microprocessor uses the computer's I/O ports to specify a unique control register in BIOS-level programs. A control register is the same as a memory address for the port's location.

MS-DOS logically assigns these names: COM1, COM2, and COM3 to the RS-232-C serial port. The computer allows you to assign either COM1 or COM2 to its port. The computer does not use COM3.

Use the TSETUP program to assign the port names. Refer to Chapter 11, *Setup and Password Security,* for details.

When you assign a port name, either COM1 or COM 2, the I/O address and interrupt level are automatically selected by the computer.

Documentation supplied with your application programs will tell you which communications parameters to select if required.

Cabling

The computer's RS-232-C serial port is an IBM PC style serial interface. It has an IBM PC AT, D-shell, male connector. This connector has 9 pins instead of the conventional 25 pins.

To connect any serial device to the computer, you need the same cable that you would use to connect that device to an IBM PC XT. Your dealer should be able to provide this type of cable. If you can't get an IBM PC XT style cable, you may need to have a custom made cable.

The pin assignments for the computer serial port are:

Pin	Signal	I/O	Description
1	DCD	I	Data carrier detect
2	RD	I	Serial receive data
3	SD	O	Serial transmit data
4	DTR	O	Data terminal ready
5	GND		Signal ground (0 V)
6	DSR	I	Data set ready
7	RTS	O	Request to send
8	CTS	I	Clear to send
9	RI	I	Ring indicator

Communication Settings

There are other considerations in serial communications. They include:

❑ The computer's internal configuration. (MS-DOS must know which logical serial port, COM1 or COM2, should receive and send data.)

❑ The internal configuration of the peripheral device.

❑   The configuration of the communications parameters. (The parameters of both devices must match.)

Use the MODE command to set these parameters on the computer as described in the MS-DOS documentation.

Many communications software packages also provide ways to set communications parameters. Refer to your software documentation for more information.

Preset Parameter Settings

When you start the computer, serial communications parameters are automatically assigned preset values. The first time you use your computer these values are set as follows:

Parameter	Preset value
baud rate	None
parity	Even
data bits	7
stop bits	1
	2 (for 110 baud)

Once you set the preferred parameter values with the MS-DOS MODE command, these become the current (preset) values. You can however, place the MODE command and your preferred parameters in your AUTOEXEC.BAT batch file. This way, each time you power on your computer your preferred values will be set. For more information on batch files, refer to your *MS-DOS documentation.*

NOTE

> *Because the baud rate is not automatically set, you cannot use a serial device without first setting this parameter. Most software applications using a serial port set the baud rate for you. Refer to the application's documentation.*

Connecting a Serial Printer

You can connect most serial printers to the computer with a standard cable that has an AT-compatible, 9-pin, D-type connector on the computer end and a 25-pin connector on the printer end. Your printer manual should tell you if non-standard writing is required.

To decide how to set the serial communications parameters, find out what the preset settings are for your printer. Compare these settings with those for the computer. If you plan to

connect other serial devices you may want to compare their requirements as well.

You can usually configure your computer to be compatible with your printer by using the printer's documentation. Also, the MODE command lets you set up the computer's parameters.

Whichever method you choose, the computer and printer settings must be compatible.

More information about attaching a serial printer and using the MODE command is contained in the MS-DOS documentation.

Connecting a Serial Mouse

You can use any serial mouse with the computer. A serial mouse requires only software and a physical connection to the computer.

To connect a mouse to the computer, you need a cable with a 9-pin connector to attach to the computer's serial port. If the mouse's cable is not compatible, see your dealer for a cable adapter.

The mouse has a driver program that you must add to your CONFIG.SYS or AUTOEXEC.BAT file. Refer to the mouse's manual for information on the driver program and on proper serial port settings.

Troubleshooting

Toshiba designed the T2150CD series computers for durability. However, should problems occur, following the procedures in this chapter can help to determine the cause.

All readers should become familiar with this chapter. Knowing what might go wrong can help prevent problems from occurring.

Problem Solving Process

Resolving problems will be much easier if you observe the following guidelines:

❑ Stop immediately when you recognize a problem exists. Further action may result in data loss or damage. You may destroy valuable problem-related information that can help solve the problem.

❑ Observe what is happening. Write down what the system is doing and what actions you performed immediately before the problem occurred. If you have a printer attached, print a copy of the screen using **PrtSc**.

❑ Isolate the problem. Using the tools available to you, such as the troubleshooting tips in this chapter and the diagnostic test program, **TDIAGS**, try to discover the specific actions that caused the problem.

The questions and procedures offered in this chapter are meant as a guide, they are not definitive problem solving techniques. Many problems can be solved simply, but a few may require help from your dealer. If you find you need to consult your dealer or others, be prepared to describe the problem in as much detail as possible.

Preliminary Checklist

Consider the simplest solution first. The items in this checklist are easy to fix and yet can cause what appears to be a serious problem.

❑ Make sure you turn on all peripheral devices before you turn on the computer. This includes your printer and any other external device you are using.

❑ Before you attach an external device, turn the computer off. When you turn the computer back on it recognizes the new device.

❑ Make sure all options are set properly in the TSETUP program.

❑ Check all cables. Are they correctly and firmly attached? Loose cables can cause signal errors.

☐ Inspect all connecting cables for loose wires and all connectors for loose pins.

☐ Check that your diskette is correctly inserted and that the write protect tab is correctly set.

Make notes of your observations and keep them in a permanent error log. This will help you describe your problems to your dealer. If a problem recurs, the log will help you identify the problem faster.

Analyzing the Problem

Sometimes the system gives clues that can help you identify why it is malfunctioning. Keep the following questions in mind:

☐ Which part of the system is not operating properly: keyboard, diskette drives, hard disk drive, printer, display. Each device produces different symptoms.

☐ Is the operating system configuration set properly? Check the configuration options.

☐ What appears on the display screen? Does it display any messages or random characters? Print a copy of the screen if you have a printer attached. Look up the messages in the software and operating system documentation. Check that all connecting cables are correctly and firmly attached. Loose cables can cause erroneous or intermittent signals.

☐ Do any icons light? Which ones? What color are they? Do they stay on or blink? Write down what you see.

☐ Do you hear any beeps? How many? Are they long or short? Are they high pitched or low? Is the computer making any unusual noises? Write down what you hear.

Record your observations so you can describe them to your dealer.

Software   The problems may be caused by your software or diskette. If you cannot load a software package, the media (usually a diskette) may be damaged or the program might be corrupted. Try loading another copy of the software.

If an error message appears while you are using a software package, check the software documentation. These documents usually include a problem solving section or a summary of error messages.

Next, check any error messages in the MS-DOS documentation.

Hardware   If you cannot find a software problem, check your hardware. First run through the items in the preliminary checklist above. If you still cannot correct the problem, try to identify the source. The next section provides checklists for individual components and peripherals.

Hardware and System Checklist

This section discusses problems caused by your computer's hardware or attached peripherals. Basic problems may occur in the following areas:

❑ System start-up	❑ Diskette
❑ Self test	❑ RAMDRIVE
❑ Power source	❑ Printer
❑ Password	❑ AccuPoint
❑ Hotkeys	❑ PS/2 mouse
❑ Keyboard	❑ Serial mouse
❑ LCD panel	❑ PCMCIA card
❑ Hard disk drive	❑ External monitor
❑ CD ROM drive	❑ Expanded memory
❑ Diskette drive	

System Start-up

When the computer does not start properly, check the following items:

❑ Self Test

❑ Power Sources

❑ Power-on Password

Self Test

To run the computer's self-test, hold down the space bar and turn on the computer. The following will be displayed:

```
 (c) Copyright xxxx Toshiba Corp. All rights reserved.

Self Test . . .
```

```
Memory Test xxxxKB

Test Complete
```

This message remains on the screen for a few seconds while the computer tests its memory.

If the self test is successful, a short beep sounds and the computer tries to load MS-DOS. Depending on how the Boot Priority is set in the TSETUP program, the computer tries to load first from drive A then from drive C, or first from drive C then from drive A.

If any of the following conditions are present, the self test failed:

❑ The computer stops updating the memory counter and does not proceed to display information or messages.

❑ A beep sounds, and after a few seconds no new messages appear.

❑ Random characters appear on the screen, and the system does not function normally.

❑ The screen displays an error message.

Turn off the computer and check all cable connections and TSETUP values. If the test fails again, contact your dealer.

If the self test ends but you do not hear a beep, check TSETUP to see if the speaker has been disabled. If it has not, your computer's speaker may be faulty. A faulty speaker does not affect normal computer operation and can be fixed by your local dealer.

Power Sources

When the computer is not plugged into an AC power outlet, the battery pack is the primary power source. However, your computer has a number of other power resources, including intelligent power supply, Real Time Clock battery and Backup battery. These resources are interrelated and any one could affect apparent power problems. This section provides check lists for AC connections and the main battery. If you cannot resolve a problem after following them, the cause could lie with another power resource. In such case, contact your dealer.

Battery

If you suspect a problem with the battery, check the AC IN LED as well as the battery LED. For information on indicators and battery operation see Chapter 7, *Power and Power-Up Modes*.

Problem	Procedure
Battery doesn't power the computer	The battery may be discharged. Connect the AC power cord to charge the battery.

Battery doesn't charge when the AC power cord is attached (AC IN indicator should glow green)	If the battery is completely discharged, it will not begin charging immediately. Wait a few minutes.
	If the battery still does not charge, make sure the outlet is supplying power. Plug in an appliance such as a lamp and see if it works. If it doesn't, try another power source.
	Check whether the battery is hot or cold to the touch. If the battery is too hot or too cold, it will not charge properly. Let it reach room temperature.
	Unplug the AC power cord and remove the battery to make sure the terminals are clean. If necessary wipe them with a soft dry cloth dipped in alcohol.
	Connect the AC power cord and replace the battery. Make sure it is securely seated.
	Check the battery icon. If it does not glow, let the computer charge the battery for at least 10 minutes. If the Battery Icon glows after 10 minutes, let the battery continue charging the battery for at least another 10 minutes before turning on the computer.
	If the icon still does not glow, the battery may be at the end of its operating life. Replace the battery.
	If you do not think the battery is at the end of its operating life, see your dealer.
Battery doesn't power the computer as long as expected	If you frequently recharge a partially charged battery, the battery might not charge to its full potential. Fully discharge the battery, then try to charge it again.
	Check the power consumption settings in TSETUP. Consider using a power saving mode.

AC power

If you have trouble turning on the computer with the AC cord connected, check the **AC IN** LED. Refer to Chapter 7, *Power and Power-Up Modes* for more information.

Problem	Procedure
AC cord doesn't power the computer (AC IN icon should glow green)	Check the connections. Make sure the cord is firmly connected to the computer and a power outlet.
	Check the condition of the cord and terminals. If

the cord is frayed or damaged, replace it. If the terminals are soiled, wipe them with cotton or a clean cloth.

If the AC power cord still does not power the computer, contact your dealer.

Password

If you forgot your password, you can use your password service diskette to start the computer. If you did not make a password service diskette or if it doesn't work, see your dealer.

Problem	Procedure
Cannot enter password	Refer to the *Password security* section in Chapter 11, *Setup and Password Security*

Hotkeys

Refer to Chapter 6, *The Keyboard* for information on using hotkeys. Make sure the operation is correct and try a few hotkey combinations.

Problem	Procedure
Hotkeys do not work	If you are using an external keyboard, make sure the Ext. Keyboard "Fn" key equivalent is set to the combination you are using.
	If you are still unable to use the hotkeys, consult your dealer.

Keyboard

Keyboard problems can be caused by your setup configuration. For more information refer to Chapter 6, *The Keyboard* and Chapter 11, *Setup and Password Security*.

Problem	Procedure
Some letter keys produce numbers	Check that the numeric keypad overlay is not selected. Press **Fn** + **F10** and try typing again.
Alt, Ctrl or CapsLock do not work as expected	Check the TSETUP program to see whether the keyboard layout is set to normal or alternative layout.
Output to screen is garbled	Make sure the software you are using is not remapping the keyboard. Remapping involves

reassigning the meaning of each key. See your software's documentation.

No output from keyboard

Is an external keyboard connected? If one is connected, the internal keyboard is disabled.

If you are still unable to use the keyboard, consult your dealer.

LCD Panel

Apparent LCD problems may be related to the computer's setup. Refer to Chapter 8, *Display Panel* and Chapter 11, *Setup and Password Security*, for more informtion.

Problem	Procedure
Dim or black display (T2150CDS only)	Adjust the contrast control dial on the right side of the computer.
Screen flicker (T2150CDS only)	Select an LCD Display Colors setting(TSETUP), that has a lower number of colors.
No display	Press hotkeys Fn + F5 to change the display priority, to make sure it is not set for an external monitor.
	Make sure instant security was not activated. Try entering your password, if you have one registered. Or, turn the power off and back on to clear instant security.

> **NOTE:**
> *Pressing the reset button will also clear instant security. But if the computer is in Resume mode, your data will not be saved.*

Problems above remain unresolved or other problems occur	Refer to your software's documentation to determine if the software is causing the difficulty.
	Run the diagnostic test.
	Contact your dealer if the problems continue.

Hard Disk Drive

Refer to Chapter 5, *Disks and Disk Drives* and Chapter 11, *Setup and Password Security*, for more informtion.

Problem	Procedure
Computer does not boot from hard drive	Insert a system diskette (refer to Chapter 5, *Disks and Disk Drives*) and reboot.
	There may be a problem with your operating system files. Refer to your Windows and DOS documentation.
Slow performance or disk errors	Your files may be fragmented. Run SCANDISK to check the condition of your files and disk. Refer to your MS-DOS documentation or on-line HELP for information on running SCANDISK and the defragmenter.
	Run the diagnostic test. Write down any reported errors. If TDIAGS does not report any errors and you have exhausted every troubleshooting possibility, make sure you have backed up all your files.
	As a last resort, reformat the hard disk. Then, reload the operating system and other files.
	If problems persist, contact your dealer.

CD ROM Drive

For more information, refer to Chapter 5, *Disks and Disk Drives*.

Problem	Procedure
You cannot access a CD in the drive	Make sure the drive's drawer is securely closed. Press gently until it clicks into place.
	Open the drawer and make sure the CD is properly seated. It should lie flat with the label facing up.
	A foreign object in the drawer could block laser light from reading the CD. Make sure there in no obstruction. Remove any foreign object.
	Check whether the CD is dirty. If necessary, wipe it with a clean cloth dipped in water or a neutral cleaner. See the *CD care* section in Chapter 5, for details on cleaning.
	Check your config.sys and autoexec.bat files to make sure they have the necessary drivers and execution lines. Refer to the *CD-ROM driver* section in Chapter 10, *Toshiba Utilities and Drivers*.

Some CDs run correctly, but others do not	The software or hardware configuration may be causing a problem. Make sure the hardware configuration matches your software's needs. Check the CD's documentation.
	Check the type of CD you are using. The drive supports audio CDs, photo CDs and ISO 9660.
	If problems persist, contact your dealer.

Diskette Drive

For more information, refer to Chapter 5, *Disks and Disk Drives*.

Problem	**Procedure**
Drive does not operate	There may be a faulty cable connection. Check the connection to the computer and to the drive.
Some programs run correctly, but others do not	The software or hardware configuration may be causing a problem. Make sure the hardware configuration matches your software's needs.
You cannot access the external 3 1/2" diskette drive	Try another disk. If you can access this disk, the original disk (not the disk drive) is probably causing the problem.
	Run the diagnostic test program TDIAGS.
	If problems persist, contact your dealer.

Diskette

Look for error messages on the computer screen. If a diskette is not properly formatted or if it does not have enough available space for the data you want to save, your operating system will alert you. Also refer to Chapter 5, *Disks and Disk Drives* for more information.

Problem	**Procedure**
Cannot write to diskette	Check the write protect tab to make sure the diskette is not write protected.
	Check the path to make sure the computer is trying to write to the correct drive.
	Try another diskette. If the computer cannot write to other diskettes, you may have a drive problem. Refer to the Diskette drive section above.
Data is corrupted	If you can access the diskette, check your software

documentation for file recovery procedures. It is common for software to automatically create backup files. If your main file is damaged, you can often rename and use the backup file.

You may be able to recover lost data by using The Undelete uitlity in Windows of by using another utility software. Refer to your Windows documentation.

Diskette error	Run SCANDISK to check the condition of your files and disk. Refer to your MS-DOS documentation or on-line HELP for information on running SCANDISK and the defragmenter.

RAMDRIVE

You can use part of your computer's memory for a RAMDRIVE, therefore RAMDRIVE problems could be memory related. For more information, refer to [Chapter 9, *Memory*](#), and to your MS-DOS documentation.

Problem	**Procedure**
RAMDRIVE doesn't function	Make sure your CONFIG.SYS file is in the root directory of drive C and that it contains this line:

```
device= path \ramdrive.sys
options
```

where *path* lists the directory that contains RAMDRIVE.SYS (for example, C:\DOS) and *options* include the size of the RAMDRIVE and the memory (conventional, extended or expanded) for the drive.

Make sure there is enough memory for a RAMDRIVE. If your RAMDRIVE is in conventional memory, load all the resident memory programs you plan to use, then execute the MS-DOS CHKDSK command. CHKDSK displays the total memory available and total memory used.

If your RAMDRIVE is in expanded memory, are you running another application that uses expanded memory? Did you select enough expanded memory (EMS) to handle your RAMDRIVE?

Confirm that your CONFIG.SYS file contains these

lines (in this order):

```
device=c:\dos\himem.sys
device=c:\dos\emm386.exe
device=c:\dos\ramdrive.sys /a
```

The RAMDRIVE.SYS drive must follow the EMM386.EXE driver.

Printer

Refer also to the printer sections in Chapter 12, *Optional Devices*, and to the troubleshooting and other relevant sections in your printer and software documentation.

Problem	Procedure
Printer does not turn on.	Check that the printer is connected to an electric outlet. Make sure the outlet is supplying power by plugging in an appliance, such as a lamp.
Computer and printer do not communicate	Make sure the printer is turned on and is on-line (ready to use).
	Inspect the cable connecting the printer to the computer for damage. Make sure it is securely connected.
	A parallel printer connects to the parallel port and a serial printer to the RS-232-C serial port. Make sure the ports are configured correctly.
	Make sure your software is configured to recognize the printer. Check your printer and software documentation.
Printer error	Run the diagnostic test TDIAGS.
	Check your printer documentation.
	If problems persist, contact your dealer.

Pointing Device

If the pointer on screen does not respond as you expect or if it is hard to see, check the settings in the AccuPoint setup program described in Chapter 10, *Toshiba Utilities and Drivers*. If you are using a PS/2 or serial mouse, also refer to Chapter 12, *Optional Devices*, and to your mouse documentation.

AccuPoint

Problem	Procedure
On-screen pointer does not respond to AccuPoint operation	If a PS/2 or serial mouse is connected, check the Setup program. The `Pointing Device` option in the `Others` option box should be set to `simultaneous` to use both the AccuPoint and an external mouse.

Make sure the following lines are contained in your AUTOEXEC.BAT file:

```
PATH %PATH%;C;\MOUSE

SET LMOUSE=C:\MOUSE

C:\MOUSE\MOUSE

SET TEMP=C:\DOS
```

These lines are necessary to load the AccuPoint driver. If they are not there, add them to your AUTOEXEC.BAT file.

Reload the AccuPoint driver from your backup diskettes, if you made them as advised earlier in the manual.

If problems persist, contact your dealer.

PS/2 Mouse

Problem	Procedure
On-screen pointer does not respond to PS/2 mouse operation	Check that the PS/2 mouse cable's 6-pin connector is firmly connected to the mouse port on the port replicator and that the replicator is firmly connected to the computer.

You may have connected the mouse after turning the computer on. Turn off the computer, make sure the mouse is firmly connected and turn the computer back on.

Confirm that your CONFIG.SYS or AUTOEXEC.BAT contains a mouse driver.

Is your software configured to recognize the mouse? Check the software documentation.

If problems persist, contact your dealer.

Serial Mouse

Problem	Procedure

On-screen pointer does not respond to serial mouse operation	Check for a firm connection between the computer's (or port replicator's) serial port and the cable's 9-pin connector.
	Did you connect the mouse before turning on the computer?
	Is the `serial port` option in the TSETUP program set properly?
	Confirm that your CONFIG.SYS or AUTOEXEC.BAT has a mouse driver program.
	Is your software configured to recognize the mouse? Check the software documentation.
	If problems persist, contact your dealer.

PCMCIA Card

Refer also to Chapter 12, *Optional Devices*.

Problem	Procedure
PCMCIA card error occurs	Reseat the PCMCIA card to make sure it is firmly connected.
	Make sure the connection between the external device and the card is firm.
	Check the card's documentation and the *Card Manager User's Guide*.
	If problems persist, contact your dealer.

External Monitor

Refer also to Chapter 12, *Optional Devices,* and to your monitor's documentation.

Problem	Procedure
Monitor does not turn on	Make sure that the external monitor's power switch is on. Confirm that the external monitor's power cable is plugged into a working power outlet.
No display	Try adjusting the contrast and brightness controls on the external monitor.
	Press hotkeys Fn + F5 to change the display priority, to make sure it is not set for the internal display.

Display error occurs	Check that the cable connecting the external monitor to the computer or port replicator is attached firmly and that the port replicator is securely connected to the computer.
	Run the diagnostic test program.
	If problems persist, contact your dealer.

Expanded Memory

Refer also to Chapter 9, *Memory*, and to your MS-DOS documentation.

Problem	Procedure
Programs requiring LIM-EMS expanded memory	Check the verison of EMM386.EXE required by your software. Make sure the version you are using is compatible with your applications.
	Make sure you have sufficient memory to run your program. For more information, see Chapter 9, *Memory*.
	Your CONFIG.SYS file must be in your root directory and must include:
	`device=c:\dos\himem.sys`
	`device=c:\dos\emm386.exe`
	EMM386.EXE automatically tests expanded memory each time you start your computer. Check for any error messages displayed during system start-up.
	Run the diagnostic test program. The memory test automatically checks expanded memory.
	If problems persist, contact your dealer.

Diagnostic Test

The diagnostic test program checks system components to help you determine the cause of the computer's problem.

Executing the Diagnostic Test Program

To start the diagnostics, follow these steps:

1. Check all cables for loose connections.

2. Exit any application you may be using and close Windows.

3. Be sure the computer is not in virtual 86 mode. The test will not run in that mode. If you try to run the test in virtual 86 mode, the following message will be displayed:

   `Cannot execute in a virtual 8086 mode.`

   If the preceding message is displayed, remove memory managers from your config.sys file. See your MS-DOS documentation for information on the config.sys file.

4. Go to drive C and at the DOS prompt C:\>, type **TDIAGS**. MS-DOS loads the diagnostic test and displays the following screen:

   `TOSHIBA personal computer xxxx DIAGNOSTICS`

   `version x.xx (c) copyright TOSHIBA Corp. 19xx`

   `Test the DIAGNOSTICS (Y/N)`

5. To execute the program type **Y**; to exit, type **N**.

Choosing Test Options

Before the test begins, you are prompted to select whether to test the following components. To select the test, type **Y** at the prompt, otherwise type **N**.

Component	Prompt

Diskette drive   `Test the FDD (Y/N)?`

This test writes test patterns to the diskette. Use a formatted, write-enabled diskette. Data on the diskette will be destroyed.

Hard disk drive   `Test the HDD (Y/N)?`

This test writes a small amount of data to the hard disk.

Printer   `Test the Printer (Y/N)?`

Before executing this test, make sure the printer is connected and turned on.

If you select **Y**, the following prompt will appear:

`Compatible with IBM printer (Y/N)?`

Select **Y** for IBM compatible and **N** for non-compatible. If you are not sure, select **N**. Selecting **Y** for a non-compatible printer may result in garble and processing of excess pages.

Test Sequence

The diagnostic test checks the computer and attached peripherals in the following sequence:

1. System test
2. Memory test
3. Display test
4. Floppy Disk (Diskette) test
5. Hard disk test
6. Printer test

When a test is in progress, the program displays:

IN PROGRESS *TTSSDSS*

where **TT** indicates the test number, the first **SS** indicates the subtest number, **D** indicates the drive (if tested), and the second **SS** indicates the hardware status.

Subtests

The following gives details on each subtest:

System/Memory

The System and Memory tests run together for about one minute. The System test displays no messages. The Memory test displays the following message:

MEMORY TEST   IN PROGRESS *XXXXXX*

where xxxxxx is the current memory location being tested. The memory test includes conventional and extended memory.

If either test aborts:

1. Write down everything that appears on screen.
2. Press **Ctrl + Pause (Break)** or **Ctrl + C** to return to the diagnostics menu.
3. Consult your dealer.

Display Tests (Character Attributes)

After the System/Memory tests end, the Display tests begin with the Character attributes screen.

Make sure the line under the message NEXT LINE SHOWS BLINKING DISPLAY is actually blinking.

After you press **Enter**, the test screen appears.

If your display does not match the test screen, write down the differences and contact

your dealer. If it does match, press **Enter** to continue the display test.

(Character sets)

There are two character set tests. The first checks that the screen can display characters in a 40-column by 25-row format (the characters are wider than normal).

If the display screen matches the first screen, start the second character set test by pressing **Enter**. If your screen doesn't match the diagnostic test display, write down the differences and contact your dealer.

The second test checks that the screen can display characters in an 80-column by 25-row format.

If the display screen matches the test screen, press **Enter** to start the next test. If your screen doesn't match the diagnostic test display, write down the differences and contact your dealer.

(Graphics Capabilities)

This set of displays tests the screen's capabilities for each graphics mode.

During the test, the resolution and mode number appear above an image representing the mode's capabilities. The number inside the brackets is the mode number. If the image appears normal, press **Enter** to test the next mode. If the image on your screen appears different from the one shown below, contact your dealer.

The first two tests check the 320 x 200 graphics modes.

The remaining screens 640 x 200 mode 6, 640 x 200 mode E, 640 x 350 mode 10 and 640 x 480 mode display similar tests.

Floppy Disk (Diskette Test)

After the last graphics display test, the program displays the following prompt:

```
FLOPPY DISK        503000

Mount the work disk(s) on the drive(s),
then press [Enter] key

[Warning  :  The contents of the disk(s)
will be destroyed]
```

If diskette drives are connected, this prompt asks you to insert a diskette into each diskette drive you want to test. The diskettes you insert should contain no important information because the test destroys all data on the diskette.

The diskettes must be write enabled. For 3 1/2" diskettes, the write-protect tab must be closed so you cannot see through it.

These disks must also be formatted. See Chapter 5, *Disks and Drives*, for more information on write enabling and formatting disks.

Press **Enter** when you've inserted the disk(s) in the drive(s). The test begins and displays:

`FLOPPY DISK IN PROGRESS 503000`

If there is an error, the `ABORTED` message appears. Write down the highlighted numbers and press **Ctrl + Break** to return to the `DIAGNOSTICS MENU`. If a disk drive fails, check the following:

❑   Disks are properly formatted.

❑   Disks are not damaged.

Try another disk and if there is still a problem, consult your dealer.

NOTE

> *If you change your mind and decide not to test a disk, press* **Ctrl + Break** *to return to the* `DIAGNOSTICS MENU`.

Hard Disk Test

If the diskette test passes, and you selected to test the hard disk, you see the following message:

`HARD DISK IN PROGRESS 805000`

If this test aborts, write down any messages and consult your dealer. The computer or the drive may require service. Press **Enter** to return to the `Diagnostics menu`.

Printer Test

If the hard disk test passes and you selected to test the printer, you see the following message:

`PRINTER TEST       IN PROGRESS       60xxxx`

where xxxx is a counter that shows the test is still in progress.

If you specified an IBM compatible printer, the test prints six lines that show normal,

double width, compressed, emphasized, double strike, and all characters.

If you specified a printer that is not IBM compatible, the test prints repeated lines of all characters in a revolving pattern.

If an error occurs, the test displays the `ABORTED` message.

Write down all messages and highlighted numbers and check the following items:

❑ Is the printer cord securely plugged into a live wall outlet?

❑ Is the printer cable properly connected to the computer?

❑ Is the printer turned on?

❑ Is the printer ready (on-line and selected)?

Run the test again. If the `ABORTED` message appears, consult your dealer.

If the printer tests successfully, the following message is displayed:

DIAGNOSTICS completed

Press [Enter key]

Press **Enter** to return to the `Diagnostics menu` .

Toshiba Support

If you require any additional help using your new T2150CD series computer or if you are having problems operating the computer, you may need to contact Toshiba for additional technical assistance.

Before You Call

Some problems you experience may be related to software or the operating system, it is important to investigate other sources of assistance first. Before contacting Toshiba, try the following:

❑ Review troubleshooting sections in the *Microsoft Windows for Workgroups 3.11 & MS-DOS 6.2 Concise User's Guide* and documentation for peripheral devices.

❑ If a problem occurs when you are running software applications, consult the software documentation for troubleshooting suggestions. Call the software company's technical support for assistance.

❑ Consult the dealer you purchased your computer and/or software from. They are your best sources for current information and support.

Where to Write

If you are still unable to solve the problem and suspect that it is hardware related, write to Toshiba at the nearest location listed below:

Outside of Europe

Australia

Toshiba (Australia) Pty. Ltd.
Information Systems Division
84-92 Talavera Road
North Ryde N.S.W.
2113 Sydney, Australia

Canada

Toshiba of Canada, Limited
191 McNabb Street
Markham, Ontario
L3R 8H2

Singapore

Toshiba Information Systems (Singapore) Pte. Ltd.
152 Beach Road
#17-01/04 Gateway East
Singapore 0718
Singapore

United States of America

Toshiba America Information Systems, Inc.
9740 Irvine Boulevard
Irvine, California 92718
USA

In Europe

Belgium

Toshiba Information Systems (Belgium) S.A N.V
Rue Colonel Bourg Straat 123-125

1140 Brussels
Belgium

Federal Republic of Germany

Toshiba Europa (I.E.) GmbH
Geschäftsbereich Deutschland
Hammfelddamm 8
41460 Neuss
Federal Republic of Germany

France

Toshiba Information Systems (France) S.A.
7, rue Ampère B.P. 131
92804 Puteaux Cédex
France

Italy

Olidata s.p.a.
Via Cavalcavia n. 55
1-47023 Cesena (FO)
Italy

Netherlands

Toshiba Information Systems (Benelux) B.V.
Rivium Boulevard 41
2909 LK Capelle a/d Ussel
Netherlands

Spain

Toshiba Information
Parque Empresarial San Ferando
Edificio Europa, la Planta
Escalera A 28831 Madrid
Spain

United Kingdom

Toshiba Information Systems (U.K.), LTD
Toshiba Court
Weybridge Business Park

Addlestone Road
Weybridge, Surrey KT15 2UL
United Kingdom

The Rest of Europe

Toshiba Europa (I.E.) GmbH
Geschäftsbereich Deutschland
Hammfelddamm 8
41460 Neuss
Federal Republic of Germany

Specifications

This appendix summarizes the T2150CD series computer's technical specifications.

Physical Dimensions

T2150CDS	Weight	3.4 kilograms (7.5 pounds) (including battery)
	Size	299 x 53 x 226 millimeters (11.8 x 2.1 x 8.9 inches)
T2150CDT	Weight	3.4 kilograms (7.5 pounds) (including battery)
	Size	299 x 53 x 226 millimeters (11.8 x 2.1 x 8.9 inches)

Environmental Requirements

Conditions	Ambient Temperature	Relative Humidity
Operating	5ºC (41ºF) to 35ºC (95ºF)	20% to 80%
Non-operating	-10ºC (-23ºF) to 65ºC (149ºF)	10% to 90%
Thermal gradient	20ºC per hour *maximum*	
Wet-bulb temperature	26ºC *maximum*	

Conditions	Altitude (from sea level)
Operating	0 to 3,000 meters (0 to 10,000 feet)
Non-operating	0 to 10,000 meters (0 to 30,000 feet) *maximum*

Power Requirements

AC power	115 - 240 volts AC
	50 or 60 hertz (cycles per second)

Processor

Built-in	microprocessor:
	SL Enhanced Intel DX4 (75MHz, 3.3V)

Memory

Built-in	T2150CDS: 4MB of system memory
	T2150CDT: 8 MB of system memory
	Expanded memory can be configured as a RAM disk.
Optional	4MB/8MB/16MB/24MB memory cards support LIM-EMS expanded memory or extended RAM.

Disks

Built-in hard disk	520 million bytes (500 MB)
	14-millisecond average access time
External diskette drive	3 1/2", 1.44-megabyte or 720-kilobyte
CD ROM drive	double-speed 540 MB compact disk read-only memory

The drive supports the following formats:
- Audio CD
- Photo CD
- ISO 9660

Display

Built-in	T2150CDS color LCD:
	supertwist nematic (STN)
	color display, 640 horizontal x 480 vertical pixels for 640 x 480 VGA compatibility, contrast control.
	T2150CDT color LCD:
	thin-film transistor (TFT)
	color display, 640 horizontal x 480 vertical pixels for 64K-color 640 x 480 SVGA compatibility.

Keyboard

Built-in	82-keys or 84-keys, compatible with IBM enhanced keyboard, embedded numeric overlay, dedicated cursor control keys.

Ports

Parallel	parallel printer or other parallel device
Serial	RS-232C compatible port
External Monitor	the 15-pin, analog VGA port
Keyboard	connects an external PS/2 keyboard
Port Replicator	special port for connecting port replicator
Microphone	enables connection of a monaural microphone
Headphone	enables connection of a stereo headphone
Line-in	lets you play stereo sound from an external device
Security lock slot	connects a security lock to anchor the computer to a desk or other large object

AccuPoint

Built-in	a pointing device, the AccuPoint, in the center of the keyboard and control buttons at the base of the keyboard enable control of the on-screen pointer.

PCMCIA Card Slots

Built-in	two slots for Personal Computer Memory Card International Association cards: two 5 mm Type II or one 10.5 mm Type III

Sound system

Built-in	Sound Blaster compatible sound system provides microphone, headphone, and line-in jacks and a volume control dial.

Software

Standard MS-DOS 6.22 operating system, Windows for Workgroups 3.11, and Toshiba Utilities preloaded on hard disk.

ASCII Character Codes

Appendix B shows the American Standard Code for Information Interchange (ASCII) on the following pages. The characters in the **CHAR** column appear on your display when you type the corresponding ASCII code (as described in Chapter 6, *The Keyboard*). The characters that are printed, however, depend on the software you are using. For most software, the printed output for decimal codes 32 to 128 will match your screen display.

DEC CODE	HEX CODE	IBM CHAR	SORT SEQ	CTRL CHAR
000	00		0	NUL
001	01	☺	1	SOH
002	02	☻	2	STX
003	03	♥	3	ETX
004	04	♦	4	EOT
005	05	♣	5	ENQ
006	06	♠	6	ACK
007	07	•	7	BEL
008	08	◘	8	BS
009	09	○	9	HT
010	0A	◙	10	LF
011	0B	♂	11	VT
012	0C	♀	12	FF
013	0D	♪	13	CR
014	0E	♫	14	SO
015	0F	☼	15	SI
016	10	►	16	DLE
017	11	◄	17	DC1
018	12	↕	18	DC2
019	13	‼	19	DC3
020	14	¶	20	DC4

021	15	§	21	NAK	
022	16	▬	22	SYN	
023	17	↕	23	ETB	
024	18	↑	24	CAN	
025	19	↓	25	EM	
026	1A	→	26	SUB	
027	1B	←	27	ESC	
028	1C	∟	28	FS	
029	1D	↔	29	GS	
030	1E	▲	30	RS	
031	1F	▼	31	US	
032	20		32		
033	21	!	33		
034	22	"	34		
035	23	#	35		
036	24	$	36		
037	25	%	37		
038	26	&	38		
039	27	'	39		
040	28	(	40		
041	29	)	41		
042	2A	*	42		
043	2B	+	43		
044	2C	,	44		
045	2D	-	45		
046	2E	.	46		
047	2F	/	47		
048	30	0	48		
049	31	1	49		
050	32	2	50		

051	33	3	51
052	34	4	52
053	35	5	53
054	36	6	54
055	37	7	55
056	38	8	56
057	39	9	57
058	3A	:	58
059	3B	;	59
060	3C	<	60
061	3D	=	61
062	3E	>	62
063	3F	?	63
064	40	@	64
065	41	A	65
066	42	B	66
067	43	C	67
068	44	D	68
069	45	E	69
070	46	F	70
071	47	G	71
072	48	H	72
073	49	I	73
074	4A	J	74
075	4B	K	75
076	4C	L	76
077	4D	M	77
078	4E	N	78
079	4F	O	79
080	50	P	80
081	51	Q	81

082	52	R	82
083	53	S	83
084	54	T	84
085	55	U	85
086	56	V	86
087	57	W	87
088	58	X	88
089	59	Y	89
090	5A	Z	90
091	5B	[	91
092	5C	\	92
093	5D	]	93
094	5E	^	94
095	5F	_	95
096	60	`	96
097	61	a	97
098	62	b	98
099	63	c	99
100	64	d	100
101	65	e	101
102	66	f	102
103	67	g	103
104	68	h	104
105	69	i	105
106	6A	j	106
107	6B	k	107
108	6C	l	108
109	6D	m	109
110	6E	n	110
111	6F	o	111
112	70	p	112

113	71	q	113
114	72	r	114
115	73	s	115
116	74	t	116
117	75	u	117
118	76	v	118
119	77	w	119
120	78	x	120
121	79	y	121
122	7A	z	122
123	7B	{	123
124	7C	|	124
125	7D	}	125
126	7E	~	126
127	7F	⌂	127
128	80	Ç	67
129	81	ü	85
130	82	é	69
131	83	â	65
132	84	ä	65
133	85	à	65
134	86	å	65
135	87	ç	67
136	88	ê	69
137	89	ë	69
138	8A	è	69
139	8B	ï	73
140	8C	î	73
141	8D	ì	73
142	8E	Ä	65

143	8F	Å	65
144	90	É	69
145	91	æ	65
146	92	Æ	65
147	93	ô	79
148	94	ö	79
149	95	ò	79
150	96	û	85
151	97	ù	85
152	98	ÿ	89
153	99	Ö	79
154	9A	Ü	85
155	9B	¢	36
156	9C	£	36
157	9D	¥	36
158	9E	₧	36
159	9F	ƒ	36
160	A0	á	65
161	A1	í	73
162	A2	ó	79
163	A3	ú	85
164	A4	ñ	78
165	A5	Ñ	78
166	A6	ª	166
167	A7	º	167
168	A8	¿	63
169	A9	⌐	169
170	AA	¬	170
171	AB	½	171
172	AC	¼	172
173	AD	¡	33

174	AE	«	34
175	AF	»	34
176	B0	▒	
177	B1	▓	
178	B2	▓	
179	B3	│	
180	B4	┤	
181	B5	╡	
182	B6	╢	
183	B7	╖	
184	B8	╕	
185	B9	╣	
186	BA	║	
187	BB	╗	
188	BC	╝	
189	BD	╜	
190	BE	╛	
191	BF	┐	
192	C0	└	
193	C1	┴	
194	C2	┬	
195	C3	├	
196	C4	─	
197	C5	┼	
198	C6	╞	
199	C7	╟	
200	C8	╚	
201	C9	╔	
202	CA	╩	
203	CB	╦	

204	CC	╞	
205	CD	=	
206	CE	╫	
207	CF	⊥	
208	D0	⊥	
209	D1	⊤	
210	D2	╥	
211	D3	╙	
212	D4	╘	
213	D5	╒	
214	D6	╓	
215	D7	╋	
216	D8	┿	
217	D9	┘	
218	DA	┌	
219	DB	█	
220	DC	▄	
221	DD	▌	
222	DE	▐	
223	DF	▀	
224	E0	α	
225	E1	β	83
226	E2	Γ	
227	E3	Π	
228	E4	Σ	
229	E5	σ	
230	E6	μ	
231	E7	γ	

232	E8	ϙ
233	E9	θ
234	EA	Ω
235	EB	δ
236	EC	∞
237	ED	φ
238	EE	ε
239	EF	∩
240	F0	≡
241	F1	±
242	F2	≥
243	F3	≤
244	F4	⌈
245	F5	⌋
246	F6	÷
247	F7	≈
248	F8	◌
249	F9	●
250	FA	·
251	FB	√
252	FC	ⁿ
253	FD	²
254	FE	■
255	FF	

Keyboard Layouts

Figure C-1 United Kingdom (UK)

Figure C-2 United States (US)

Figure C-3 Italian (IT)

spainkey.bmp

Figure C-4 Spanish (SP)

swisskey.bmp
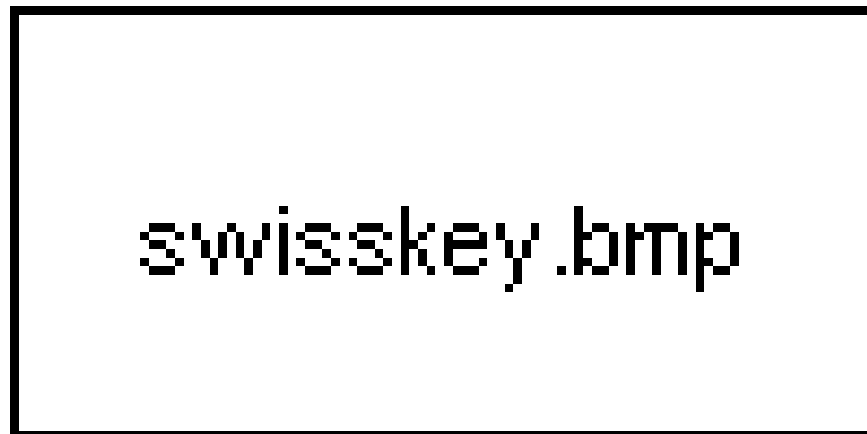
Figure C-5 Swiss-German (SL)

scandina.bmp

Figure C-6 Scandinavian (SC)

Figure C-7 German (GR)

Figure C-8 French (FR)

AC Power Cord and Connectors

The power cord's AC input plug must be compatible with the various international AC power outlets and the cord must meet the standards for the country in which it is used.

All cords must meet the following specifications:

Length:	Minimum 2 meters (6.5 ft.) Maximum 3 meters (9.75 ft.)
Wire size:	Minimum 0.75 mm$_2$
Current rating:	Minimum 2.5 ampres
Voltage rating:	125 or 250 VAC (depending on country's power standards)

Certification agencies

U.S. and Canada: UL listed and CSA certified

No. 18 AWG, Type SVT or SPT-2 two conductor

Europe:

Australia:	AS
Austria:	OVE
Belgium:	CEBEC
Denmark:	DEMKO
Finland:	SETI
France:	UTE
Germany:	VDE
Italy:	IMQ
Norway:	NEMKO
Sweden:	SEMKO

Switzerland:	SEV
The Netherlands:	KEMA
United Kingdom:	BSI

In Europe, power cords must be VDE type, H05VVH2-F.

For the United States and Canada, plug configuration must be a 2-15P (250 V) or 1-15P (125 V) as designated in the U.S. National Electrical code handbook and the Canadian Electrical Code Part II.

The following illustrations show the plug shapes for the U.S.A. and Canada, the United Kingdom, Australia and Europe.

USA and Canada

usacan.bmp

United Kingdom

ukpower.bmp

Australia

auslia.bmp

Europe

euro.bmp
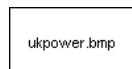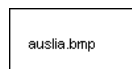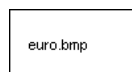
Glossary

The terms in this glossary cover the topics discussed in this manual. Alternate naming is included for reference.

Abbreviations

AC: alternating current

ANSI: American National Standards Institute

APM: advanced power manager

ASCII: American Standard Code for Information Interchange

BIOS: basic input output system

CCITT: Consultive Committee International Telegraph and Telephone

CGA: color/graphics adapter

CMOS: complementary metal-oxide semiconductor

CPU: central processing unit

CRT: cathode ray tube

DC: direct current

DOS: disk operating system

ECP: enhanced capability port

EGA: enhanced graphics adapter

EIA: Electronic Industries Association

FDD: floppy disk drive

HDD: hard disk drive

HMA: high memory area

I/O: input/output

KB: kilobyte

LCD: liquid crystal display

LED: light emitting diode

LIM-EMS: Lotus-Intel-Microsoft Expanded Memory Specification

LSI: large scale integration

MDA: monochrome display adapter

MS-DOS: Microsoft Disk Operating System

OCR: optical character recognition (reader)

PCB: printed circuit board

PCMCIA: Personal Computer Memory Card International Association

RAM: random access memory

RFI: radio frequency interference

RGB: red, green, and blue

ROM: read only memory

RTC: real time clock.

SIMM: single in-line memory module

SIO: serial input/output

STN: supertwist nematic display

SVGA: super video graphics adapter

TFT: thin-film transistor

UMA: upper memory area

UMB: upper memory block

UART: universal asynchronous receiver/transmitter

VDISK: virtual disk

VGA: video graphics array

A

Adapter: A device that provides an interface between two dissimilar electronic devices. For example, the AC adapter modifies the power from wall outlet for use by the computer. This terms also refers to the addin circuit cards that control external devices, such as video monitors and magnetic tape devices. See also board.

allocate: To assign a space or function for a specific task.

alphanumeric: A set of letters, numbers and other symbols, such as punctuation marks or mathematical symbols. Refers to the keyboard characters and character set available for the various data transfer operations of the computer.

alternating current (AC): Electric current that reverses its direction of flow at regular intervals. This type of power is usually supplied to residential and commercial wall outlets.

analog signal: A signal whose characteristics such as amplitude and frequency vary in proportion to (are an analog of) the value to be transmitted. Voice communications are analog signals.

ANSI: American National Standards Institute. An organization established to adopt and define standards for a variety of technical disciplines. For example, ANSI defined the ASCII standard and other information processing requirements.

antistatic: A material used to prevent the build-up of static electricity.

application: A group of programs that together are used for a specific task such as accounting, financial planning, spreadsheets, word processing, and games, etc.

ASCII: American Standard Code for Information Interchange. ASCII code is a set of 256 binary codes that represent the most commonly used letters, numbers, and symbols.

async: Short for asynchronous.

asynchronous: Lacking regular time relationship. As applied to computer communications, asynchronous refers to the method of transmitting data that does not require a steady stream of bits to be transmitted at regular time intervals.

asynchronous communications parameters: Values that determine how a character is encoded for transmission. These parameters include baud rate, parity, number of data bits, and the number of stop bits.

AUTOEXEC.BAT: A batch file that executes a series of MS-DOS commands and programs each time you start the computer.

AutoResume: A special feature that lets you turn off the power without first exiting a program and retain your data in RAM. When you turn on the computer, the screen appears the same as when you turned it off.

B

backup: A duplicate copy of files kept as a spare in case the original is destroyed.

base memory: See conventional memory.

batch file: A file that can be executed from the system prompt containing a sequence of operating system commands or executable files. See also AUTOEXEC.BAT.

baud (baud rate): Rate of character transmission over communication devices

such as printers, terminals, and modems. In standard usage, one baud is
equivalent to approximately one bit per second. It is named for Emil Baudot, a
pioneer in printing telegraphy.

Bell 103/212A: The American standard for modem operations. *See also* CCITT.

binary: The base two number system composed of zeros and ones (off or on), used
by most digital computers. The rightmost digit of a binary number has a value
of 1, the next a value of 2, then 4, 8, 16, and so on. For example, the binary
number 101 has a value of 5. *See also* ASCII.

BIOS: Basic Input Output System. The firmware that controls data flow within
the computer. *See also* firmware.

bit: Derived from Õbinary digit,Ó the basic unit of information used by the
computer. It is either zero or one. Eight bits is one byte. *See also* byte.

board: A circuit board. An internal card containing electronic components,
called chips, which perform a specific function or increase the capabilities of
the system.

boot: Short for bootstrap. A program that starts or restarts the computer.
The program reads instructions from a storage device into the computerÕs memory.

bps: Bits per second. Typically used to describe the data transmission speed
of a modem.

buffer: The portion of the computerÕs memory where data is temporarily stored.
Buffers often compensate for differences in the rate of flow from one device to
another.

byte: The representation of a single character. A sequence of eight bits
treated as a single unit; also the smallest addressable unit within the system.

C

cache memory: High speed memory which stores data that increases processor
speed and data transfer rate. When the CPU reads data from main memory, it
stores a copy of this data in cache memory. The next time the CPU needs that
same data, it looks for it in the cache memory rather than the main memory,
which saves time.

card: Synonym for board. *See* board.

capacity: The amount of data that can be stored on a magnetic storage device
such as a diskette (floppy disk) or hard disk. It is usually described in
terms of kilobytes (KB), where one KB = 1024 bytes and megabytes (MB), where one
MB = 1024 KB.

carrier: A single frequency or tone a modem generates when a connection is
made. See CD: Carrier Detect.

CCITT: Consultive Committee International Telegraph and Telephone. An advisory
committee established under the United Nations that provides international

communications standards. European asynchronous data communications use the CCITT standard.

CD: Carrier detect. An RS-232-C signal the modem sends to indicate it has established a connection.

Centronics: The printer manufacturer whose method of data transmission between a parallel printer and a computer has become an industry standard.

CGA: Color/graphics adapter. A video display protocol defined by the IBM Color/Graphics Monitor Adapter and its associated circuitry. This protocol supports two-color 640x200 and four-color 320x200 graphics, and 16-color 640x200 and 320x200 text modes.

character: Any letter, number, punctuation mark, or symbol used by the computer. Also synonymous with byte.

chassis: The frame containing the computer.

chip: A small semiconductor containing computer logic and circuitry for processing, memory, input/output functions and controlling other chips.

CMOS: Complementary Metal-Oxide Semiconductor. An electronic circuit fabricated on a silicon wafer that requires very little power. Integrated circuits implemented in CMOS technology can be tightly packaged and are highly reliable.

cold start: Starting a computer that is currently off (turning on the power).

COM1 and COM2: The names assigned to the serial and communication ports.

command state: A functional state of a modem that is off line, waiting for commands.

commands: Instructions you enter at the terminal keyboard that direct the actions of the computer or its peripheral devices.

communications: The means by which a computer transmits and receives data to and from another computer or device. See parallel interface; serial interface.

compatibility: 1) The ability of one computer to accept and process data in the same manner as another computer without modifying the data or the media upon which it is being transferred. 2) the ability of one device to connect to or communicate with another system or component.

components: Elements or parts (of a system) which make up the whole (system).

computer program: A set of instructions written for a computer that enable it to achieve a desired result.

computer system: A combination of hardware, software, firmware, and peripheral components assembled to process data into useful information.

configuration: The specific components in your system (such as the terminal, printer, and disk drives) and the settings that define how your system works. You use the SETUP program or the pop-up window to control your system

configuration.

control keys: A key or sequence of keys you enter from the keyboard to initiate a particular function within a program.

controller: Built-in hardware and software that controls the functions of a specific internal or peripheral device (e.g. keyboard controller).

conventional memory: The first 640KB of RAM where MS-DOS runs programs and temporarily stores data. Also called standard memory.

CPS: Characters per second. Typically used to indicate the transmission speed of a printer.

CPU: Central processing unit. The portion of the computer that interprets and executes instructions.

CRT: Cathode Ray Tube. A vacuum tube in which beams projected on a fluorescent screen-producing luminous spots. An example is the television set.

CTS: Clear to Send. An RS-232-C signal that indicates a change in the transmission direction; used in the exchange of data between computer and serial device.

cursor: A small, blinking rectangle or line that indicates the current position on the display screen.

D

data: Information that is factual, measurable or statistical that a computer can process, store, or retrieve.

data bits: A data communications parameter controlling the number of bits (binary digits) used to make up a byte. If data bits = 7 the computer can generate 128 unique characters. If data bits = 8 the computer can generate 256 unique characters.

DC: Direct Current. Electric current that flows in one direction. This type of power is usually supplied by batteries.

DCE: Data Communication Equipment. DCE and DTE indicate whether the specific equipment transmits on pin 3 and receives on pin 2 (DCE) or transmits on pin 2 and receives on pin 3 (DTE). *See* DTE.

default: The parameter value automatically selected by the system when you or the program do not provide instructions. Also called a preset value.

delete: To remove data from a disk or other data storage device. Synonymous with erase.

device driver: A program that controls communication between a specific peripheral device and the computer. The CONFIG.SYS file contains device drivers that MS-DOS loads when you turn the computer on.

disk cache: A technique used to speed up processing. Each time your application receives data from a disk, a special program stores data read from the disk in a reserved area of RAM. When the application next requests more data, it first looks for it in the disk cache, thus reducing data retrieval time.

disk drive: The device that randomly accesses information on a disk and copies it to the computerÕs memory. It also writes data from memory to the disk. To accomplish these tasks, the unit physically rotates the disk at high speed past a read-write head.

disk storage: Storing data on magnetic disk. Data is arranged on concentric tracks much like a phonograph record.

diskette: A diskette that stores magnetically encoded data used on a microcomputer. Also called floppy disk.

display: A CRT, plasma screen, LCD, or other image producing device used to view computer output.

documentation: The set of manual and/or other instructions written for the users of a computer system or application. Computer system documentation typically includes procedural and tutorial information as well as system functions.

DOS: Disk operating system. *See* operating system.

driver: A software program, generally part of the operating system, that controls a specific piece of hardware (frequently a peripheral device such as a printer or mouse).

DSR: Data Set Ready. An RS-232-C signal that indicates to the computer that the printer or modem is ready to receive information.

DTE: Data Terminal Equipment. The RS-232-C signals DTE and DCE indicate whether the specific equipment transmits on pin 2 and receives on pin 3 (DTE) or transmits on pin 3 and receives on pin 2 (DCE). See DCE.

DTMF: Dual Tone Multi-frequency. An RS-232-C signal. *See also* touch-tone dialing.

DTR: Data Terminal Ready. An RS-232-C signal that indicates to the printer or modem that the computer is ready for operation.

duplex: A parameter describing how two devices communicate. In half-duplex, the two devices can both send and receive but not at the same time. In full-duplex, each device can send and receive at the same time.

E

echo: To send back a reflection of the transmitted data to the sending device. You can display the information on the screen, or output it to the printer, or both. When a computer receives back data it transmitted to a CRT (or other peripheral device) and then retransmits the data to printer, the printer is said to echo the CRT.

EGA: Enhanced Graphics Adapter. A video display protocol defined by the IBM Enhanced Graphics Adapter and its associated circuitry for direct drive TTL displays that supports 16-color/monochrome 640x350 and 16-color 640x200 and 320x200 graphics, and 16-color 640x350 and 320x350 text modes.

EIA: Electronic Industries Association. A trade association that publishes technical standards related to the electronics industry.

emulation: A technique where a piece of hardware acts like another device.

erase: *See* delete.

escape: 1) A code (ASCII code 27), signaling the computer that what follows are commands; used with peripheral devices such as printers and modems. 2) A means of aborting the task currently in progress.

escape guard time: A time before and after an escape code is sent to the modem which distinguishes between escapes that are part of the transmitted data, and escapes that are intended as a command to the modem.

execute: To interpret and execute instruction.

expanded memory: Memory, in addition to the 640 kilobytes of conventional memory managed by MS-DOS, that is mapped to a 64-kilobyte window between 640 kilobytes and 1 megabyte on the memory map. This memory is managed in accordance with the Expanded Memory Specification standard jointly developed by Lotus, Intel, and Microsoft called LIM-EMS.

extended memory: Memory, in addition to the 640 kilobytes of conventional memory managed by MS-DOS, that is mapped beyond 1 megabyte on the memory map.

F

file: A collection of related information; a file can contain data, programs, or both.

firmware: A set of instructions built into the hardware which control and direct a microprocessorÕs activities.

fixed disk: *See* hard disk.

floppy disk: A small, flexible disk that stores magnetically encoded data used on a microcomputer. Also called a diskette.

floppy disk drive (FDD): An electro-mechanical device that reads and writes to floppy disks. *See also* floppy disk and diskette.

format: The process of readying a blank disk for its first use. Formatting establishes the structure of the disk that the operating system expects before it writes files or programs onto the disk.

full-duplex: *See* duplex.

function keys: The keys labeled **F1** through **F12** that tell the computer to

perform certain functions.

G

GND: Ground. An RS-232-C signal used in the exchange of data between a computer and serial device.

graphics: The use of drawings, pictures, or other images, such as charts or graphs, to present information.

H

half duplex: *See* duplex.

handshake: The series of signals between a computer and another peripheral device (for example, a modem and a computer) that sets the parameters required for exchanging data.

hard disk: A non-removable disk usually referred to as drive C. The factory installs this disk and only a trained engineer can remove it for servicing. Also called fixed disk.

hard disk drive (HDD):   An electro-mechanical device that reads and writes a hard disk. *See also* hard disk.

hardware: The physical electronic and mechanical components of a computer system: typically, the computer itself, external disk drives, etc. *See also* software and firmware.

hexadecimal: The base 16 numbering system composed of the digits 0 through 9 and the letters A, B, C, D, E, and F.

high memory area (HMA): The first 64KB of extended memory.

host computer: The computer that controls, regulates, and transmits information to a device or another computer.

hot key: The T2400 Series feature in which certain keys in combination with the extended function key, **Fn**, can be used to set system parameters, such as speaker volume.

I

icon: A small graphic image displayed on the screen or in the indicator panel. In Windows, an icon represents an object that the user can manipulate.

input: The data or instructions you provide to a computer, communication device or other peripheral device from the keyboard or external or internal storage devices. The data sent (or output) by the sending computer is input for the receiving computer.

instruction: Statements or commands that specify how to perform a particular task.

interface: 1) Hardware and/or software components of a system used specifically to connect one system or device to another. 2) To physically connect one system or device to another to exchange information. 3) The point of contact between user, the computer, and the program, for example, the keyboard or a menu.

I/O: Input/output. Refers to acceptance and transfer of data to and from a computer.

I/O devices: Equipment used to communicate with the computer and transfer data to and from it.

J

jumper: A small clip or wire that allows you to change the hardware characteristics by electrically connecting two points of a circuit.

K

K: Taken from the Greek word kilo, meaning 1000; often used as equivalent to 1024, or 2 raised to the 10th power. *See also* byte and kilobyte.

KB: *See* kilobyte.

keyboard: An input device containing switches that are activated by manually pressing marked keys. Each keystroke activates a switch that transmits a specific code to the computer. For each key, the transmitted code is, in turn, representative of the (ASCII) character marked on the key.

kilobyte (KB): A unit of data storage equal to 1024 bytes. *See also* byte and megabite.

L

Light Emitting Diode (LED): A semiconductor device that emits light when a current is applied.

LIM-EMS: Lotus-Intel-Microsoft Expanded Memory Specification The standard that defines expanded memory. *See* expanded memory.

Liquid Crystal Display (LCD): Liquid crystal sealed between two sheets of glass coated with transparent conducting material. The viewing-side coating is etched into character forming segments with leads that extend to the edge of the glass. Applying a voltage between the glass sheets darkens the liquid crystal to provide contrast to lighted portions of the display.

LSI: Large Scale Integration.   1) A technology that allows the inclusion of up to 100,000 simple logic gates on a single chip. 2) An integrated circuit that uses the large scale integration.

M

main board: See motherboard.

MDA: Monochrome Display Adapter. A video display protocol defined by the IBM Monochrome Display Adapter and its associated circuitry for direct drive TTL displays that supports a monochrome 720x350 text mode.

megabyte (MB): A unit of data storage equal to 1024 kilobytes. *See also* kilobyte.

menu: A software interface that displays a list of options on the screen. Also called a screen.

microprocessor: A hardware component contained in a single integrated circuit that carries out instructions. Also called the central processing unit (CPU), one of the main parts of the computer.

mode: A method of operation, for example, the boot mode or the resume mode.

modem: Derived from modulator/demodulator, a device that converts (modulates) digital data for transmission over telephone lines and then converts modulated data (demodulates) to digital format where received.

monitor: A device that uses rows and columns of pixels to display alphanumeric characters or graphic images. *See* CRT.

motherboard: A name sometimes used to refer to the main printed circuit board in processing equipment. It usually contains integrated circuits that perform the processorÕs basic functions and provides connectors for adding other boards that perform special functions. Sometimes called a main board.

N

non-system disk: A formatted diskette (floppy disk) you can use to store programs and data but you cannot use to start the computer. *See* system disk.

non-volatile memory: Memory, usually read-only (ROM), that is capable of permanently storing information. Turning the computerÕs power off does not alter data stored in non-volatile memory.

numeric keypad overlay: A feature that allows you to use certain keys on the keyboard to perform numeric entry, or to control cursor and page movement.

O

OCR: Optical Character Recognition (reader). A technique or device that uses laser or visible light to identify characters and input them into a storage device.

OCR wand: A device that reads, using an optical device, hand written or machine

printed symbols into a computer. *See also* OCR.

on-line state: A functional state of a peripheral device when it is ready to receive or transmit data.

operating system: a group of programs that controls the basic operation of a computer. Operating system functions include the interpreting programs, creating data files, and controlling the transmission and receipt (input/output) of data to and from memory and peripheral devices. Toshiba portable computers use the MS-DOS operating system.

operating system disk: The disk(s) containing the operating system. *See* system disk.

output: The results of a computer operation. Output commonly indicates data 1) printed on paper, 2) displayed at a terminal, 3) sent through the serial port of internal modem, or 4) stored on some magnetic media.

P

parallel: Refers to two or more processes or events that can occur simultaneously, and without interfering with each other. *See also* serial.

parallel interface: Refers to a type of information exchange that transmits information one byte (8 bits) at a time. *See also* serial interface.

parity: 1) The symmetrical relationship between two parameter values (integers) both of which are either on or off; odd or even; 0 or 1. 2) In serial communications, an error detection bit that is added to a group of data bits making the sum of the bits even or odd. Parity can be set to none, odd, or even.

password: A unique string of characters used to identify a specific user.

pel: The smallest area of the display that can be addressed by software. Equal in size to a pixel or group of pixels. *See* pixel.

peripheral device: An I/O device that is external to the central processor and/or main memory such as a printer or a mouse.

pixel: A picture element. The smallest dot that can be made on a display or printer. Also called a pel.

pop-up window: A window you can display at any time to change most configuration options and monitor the charge of the battery.

port: The electrical connection through which the computer sends and receives data to and from devices or other computers.

printed circuit board (PCB): A hardware component of a processor to which integrated circuits and other components are attached. The board itself is typically flat and rectangular, and constructed of fiberglass, to form the attachment surface.

program: A set of instructions a computer can execute that enables it to

achieve a desired result. See also application.

prompt: A message the computer provides indicating it is ready for or requires information or an action from you.

protected mode: A microprocessor mode introduced with the Intel 80286 processor. This mode supports up to four gigabytes of address space and vides support for multitasking and other advanced features.

protocol: A set of rules that allows devices to exchange information without affecting its contents.

pulse dialing: A type of dialing that uses rotary pulses to generate the telephone number.

R

RAMDRIVE: Part of the computerÕs random access memory assigned to simulate a disk. RAMDRIVE is a feature of MS-DOS.

Random Access Memory (RAM): High speed memory within the computer circuitry that can be read or written to.

RD: Receive Data. An RS-232-C signal used in the exchange of data between the computer and a serial printer or modem.

Radio frequency interference (RFI) shield: A metal shield enclosing the printed circuit boards of the printer or computer to prevent radio and TV interference. All computer equipment generates radio frequency signals. The FCC regulates the amount of signals a computing device can allow past its shielding. A Class A device is sufficient for office use. Class B provides a more stringent classification for home equipment use. Toshiba portable computers comply with Class B computing device regulations.

real mode: A microprocessor mode that supports up to 1MB of memory and can only run one program at a time.

restart: Resetting a computer without turning it off (also called Õwarm bootÕ or Õsoft resetÕ). To restart the computer, press Ctrl + Alt+ Del while the computer is on. See also boot.

RGB: Red, green, and blue. A device that uses three input signals, each activating an electron gun for a primary additive color (red, green, and blue) or port for using such a device. *See also* CRT.

RJ11: A modular telephone jack.

ROM: Read Only Memory: A non-volatile memory chip manufactured to contain information that controls the computerÕs basic operation. You cannot access or change information stored in ROM.

RS-232-C: The Electronic Industries Association (EIA) interface standard that describes the 25-pin connector interface and control, data, and status signals that allow asynchronous communications between computers, printers, communications and other peripheral devices.

RTS: Request to send. An RS-232-C signal used in the exchange of data between the computer and a serial printer or modem.

S

SD: Send data. An RS-232-C signal used in the exchange of data between the computer and a printer or modem.

serial: The handling of data bits one after the other.

serial communications: A communications technique that uses as few as two interconnecting wires to send bits one after another.

serial interface: Refers to a type of information exchange that transmits information sequentially, one bit at a time. Contrast: Parallel interface.

serial port: A communications port (COM1 or COM2) to which you can connect devices, such as a modem, mouse, or serial printer.

SIMM: Single In-Line Memory Module. RAM semiconductors used for memory expansion.

SIO: Serial Input/Output. The electronic methodology used in serial data transmission.

soft key: Key combinations that emulate keys on the IBM keyboard, change some configuration options, stop program execution, and access the numeric keypad overlay.

software: The set of programs, procedures and related documentation associated with a computer system. Specifically refers to computer programs that direct and control the computer systemÕs activities. *See also* hardware.

stop bit: One or more bits of a byte that follow the transmitted character or group codes in asynchronous serial communications.

subpixel: Three elements, one red, one green and blue (RGB), that make up a pixel on the color LCD. The computer sets subpixels independently, each may emit a different degree of brightness. See also pixel.

supertwist nematic (STN) display: A thin-screen, passive matrix color LCD that meets VGA standards with reproduction of 256 colors.

synchronous: Having a constant time interval between successive bits, characters or events.

system disk: A disk that has been formatted with an operating system. For MS-DOS the operating system is contained in two hidden files and the COMMAND.COM file. You can boot a computer using a system disk. Also called an operating system disk.

T

terminal: A typewriter-like keyboard and CRT display screen connected to the computer for the input/output of data.

TDIAG: A diagnostic program used for testing and configuring the RAM, printer, diskette drive, and video system on the T1950 series computers.

TFT: A color LCD technology that applies individual transistors to each pixel enabling fine display control and execellent screen legibility.

touch-tone dialing: A dialing technique used by the modem. Each digit (or # or *) is represented by two tones. Also called DTMF (dual tone multi-frequency).

TTL: Transistor-transistor logic. A logic circuit design that uses switching transistors for gates and storage.

U

upper memory area (UMA): The area of memory between 640 KB and 1 MB. This area, used mostly for video memory and other system functions, also contains small blocks of memory (upper memory blocks) that the computer can use for device drivers and other memory resident program.

upper memory block (UMB): Continuous regions of the upper memory area into which the computer may load programs and device drivers.

V

VDISK: Virtual disk. Part of the computerÕs random access memory assigned to simulate a disk. VDISK is a feature of MS-DOS operating system.

VGA: Video graphics array is an industry standard video adapter that lets you run any popular software.

virtual 8086 mode: A microprocessor mode introduced with the Intel 80386 processor that allows the computer to emulate multiple real mode processors (8086) and still switch to and from protected mode.

volatile memory: Random access memory (RAM) that stores information as long as the computer is connected to a power source.

W

warm start: Restarting or resetting a computer without turning it off.

window: A portion of the screen that can display its own application or document. Often used to mean a Microsoft Windows window.

write protection: A method for protecting a floppy disk (diskette) from accidental erasure.